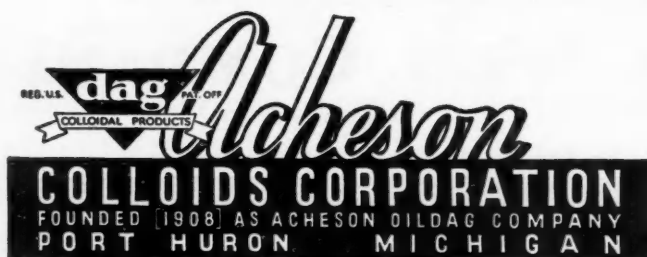




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Manufacturers of "dag" Brand Colloidal Products



March 16, 1935

AUTOMOTIVE INDUSTRIES

AUTOMOBILE

Reg. U. S. Pat. Off

Published Weekly
Volume 72
Number 11



JULIAN CHASE, Directing Editor

DON BLANCHARD, Editor

P. M. HELDT, Engineering Editor
JOSEPH GESCHELIN, Eng. Editor
HAROLD E. GRONSETH, Detroit News Editor

JEROME H. FARRIS, Ass't Editor

T. LAWTON SLAUGH, News Editor

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Autoland, Philadelphia

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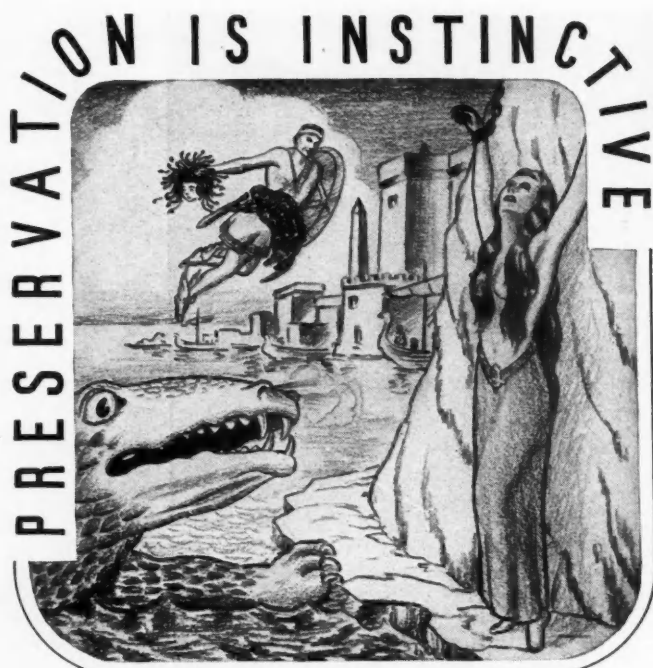
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Automotive Industries

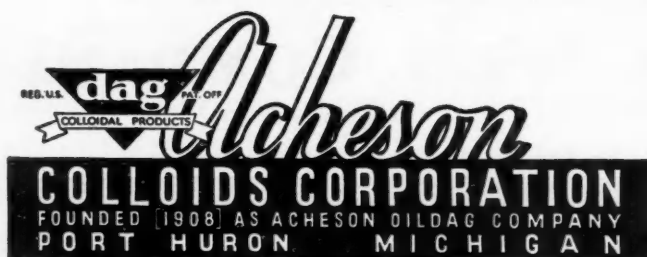


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Automotive Industries

Car Sales Continue Uptrend

Current Retail Demand at 2,700,000 Annual Rate

by Harold Gronseth

Detroit News Editor, Automotive Industries

Retail demand for motor vehicles continues on the uptrend, according to early March figures. Although as was expected, the gain is narrowing over the corresponding period of last year when in March sales began to reflect the sharp expansion of output that followed the operating difficulties of the first two months.

With a more plentiful supply of cars this year, sales so far have been running at the rate of 2,700,000 passenger cars for the year which compared with actual registrations of 1,888,557 cars in 1934.

Registrations for February are expected to show that domestic retail sales of passenger cars approached the 200,000 mark, or more than double the volume of 94,887 cars in February last year and an increase of 46 per cent over the 136,635 new cars titled in January of this year. Domestic truck sales in February are estimated at upwards of 46,000 which compares with 34,759 in January this year and 24,476 in February, 1934.

Because of the high level of sales maintained so far into 1935, some observers are doubtful if the spring bulge will be as pronounced as in other years. Preparations for spring drives, however are under way in the form of heavier advertising, planned demonstrations, and stunts to bring in business. Even though factories are having difficulty filling orders now coming in, executives realize they "must fish when the salmon are running" and are not going to let the open season for car sales go by without putting forth every sales effort. Some officials are touring their territories, others are calling in field men and dealers to rally them for the spring offensive.

If sales departments are successful in producing a normal seasonal expansion on top of the high level of business enjoyed to date then the "happy trouble" of car shortage now being experienced (Turn to Page 377, please)

Nash Models Reduced \$70; LaFayette Down \$5 to \$50

A straight reduction of \$70 on all Nash models and reductions ranking from \$5 to \$50 on the LaFayette, have been announced by Nash Motors. A comparison of the new and old prices follows:

Standard La Fayette	New	Old
2-p. coupe	\$580	\$585
2-d. sedan with trunk.....	620	650
2-d. sedan	590	620
4-d. sedan	640	670
4-d. sedan with trunk.....	670	700
Special La Fayette		
4-d. sedan	680	720
Coupe	650	700
4-d. sedan with trunk.....	710	750
Advanced Six		
4-d. sedan	875	945
2-d. victoria	825	895
Advanced Eight		
4-d. sedan	1,095	1,165
2-d. victoria	1,045	1,115
Ambassador Eight		
4-d. sedan	1,220	1,290
2-d. victoria	1,170	1,240



Henry Ford dances with Irene Sellers, a pupil at the Berry Schools in Georgia. Mr. Ford has contributed over \$1,000,000 to the institution for the erection of new buildings.

AMA Exec. Committee Meets

Expansion of the AMA export department and the Wagner Bill were discussed at a meeting of the executive committee of the association held this week in Detroit. The committee will meet again in a week or ten days at which time it is anticipated automobile show plans will be considered.

Industry Stands on Election Returns as AFL Continues Recognition Fight

Prompt and decisive action is promised by F. J. Dillon, general organizer of the A. F. of L., in the Federation's efforts to attain its objective—recognition as the bargaining agency for automobile workers.

Mr. Dillon conferred with William Green in Washington Thursday on procedure to be followed as result of the AMA's refusal to arrange a conference

with Mr. Green and asked full authority to take such steps as he sees fit.

The A. F. of L. now plans to address requests for conferences to individual employers in both the automobile and parts industries. Alfred Reeves, AMA vice-president, had told Mr. Green in reply to the latter's request for a conference with the manufacturers that the (Turn to Page 376, please)

January Sales Largest in Five Years; Practically All Makers Show Gains

Practically every major car producer shared in the 81 per cent increase in car sales during January, which made the month the largest since 1930. The month's total stands at 136,635 units against 61,242 for the corresponding period of last year and 180,094 for the first month of 1930. However, this year's gain is shaded somewhat by the fact that the tool and die strike last year seriously hampered new model production, leaving dealers with few cars to sell. Only three manufacturers fell behind their last year's totals.

The three leaders, Ford, Chevrolet and Plymouth, made large forward strides in the first month of this year over the comparable period of last year. Their combined total of units sold was 97,728, which compares with 42,730 for January, 1934; also the percentage of the total market captured by these three cars increased from 69.76 per cent for January, 1934, to 71.52 per cent for the corresponding month this year.

While Ford increased its sales 79.4 per cent this year the company failed to capture as large a percentage of the total market as a year ago. This year's figure is 33.89 per cent against 42.17 per cent last year. In number of cars sold, however, Ford's volume almost doubled, 46,306 for January, 1935, to 25,828 in January, 1934.

Chevrolet came along fast and sold nearly four times as many cars in the first month of the year, 26,549, as during the same period of last year when the total was 7223, a gain of 267 per cent. In the matter of

Chevrolet's share of the total market this year's increased to approximately one-fifth, comparing with less than one-eighth last year.

Plymouth, too, registered a tremendous gain with 24,873 for January against 9679 for the comparable period of 1934, an increase of 157 per cent. In this case the percentage of the total market moved up from 15.80 for January of last year to 18.20 for the first month of 1935.

Other large percentages of increase reported include Hudson, 980 per cent; Oldsmobile, 698 per cent; La Salle, 435 per

cent; Chrysler, 327.5 per cent; Terraplane, 277.5 per cent.

The three makes which failed to equal last year's totals were Nash, Pierce-Arrow and Willys. In the case of Nash, whose January sales were approximately 60 per cent behind those of last year, two factors are believed to be largely responsible. One is an upward shift in price class and the other, lack of production. The Nash total in January was 833, which compares with 1468 last year. However, this year Nash sold 851 La Fayettes against none last year, and this number added to the 833 give the Nash organization a combined total of 1684, approximately 200 more units than were sold in the opening month of 1934.

Detailed figures of January's retail sales in the United States are shown in the table below.

NRA Proposes Mill-Group Basis for Steel; FTC for Court Test of Multiple System

WASHINGTON — Recommendation that steel prices be quoted on a mill-group basis is made by the National Recovery Administration while a simultaneous recommendation that executive code sanction of the existing multiple basing point system be withdrawn and the system tested in the courts is made by the Federal Trade Commission in reports to the President.

The two widely conflicting reports were made in compliance with an executive order issued by the President when he approved the revised iron and steel code, May 30, 1934. He asked that the two government bodies study the problem

jointly to ascertain the "effects of the existing system in either permitting or encouraging price-fixing." The reports were ready on Dec. 1 of last year as requested. Meanwhile efforts to coordinate them were found to be unavailing. The upshot was the issuance of the two reports with their contrasting recommendations. They reflected a continuation of the differences between NRA and FTC on this much-disputed question.

However, the NRA report, in offering a compromise based on the suggestion of the President that the study be made with a view to basing prices on "areas of production," would indicate that of the two bodies the NRA has proposed a more constructive program.

The NRA would establish mill-group bases with a 50-mile radius for each where there is a productive capacity of 20,000 tons or more for each unit of rolled steel.

It would likewise prevent a manufacturer from selling from his base at a differential of more than 25c. a ton under that of a competitor when basing prices on the latter's base.

The NRA, explaining that the hearing should be given on the plan in order that it might be worked out, suggests that if the proposed change, with possible adjustments, is not accepted price protection in the code be withdrawn. While the NRA finds that the existing system is "far from perfect," it declares that much criticism directed at it is not justified.

To the automotive industry the proposed change would make the Detroit area a basing point, one of 19 additional basing areas which would be set-up under the proposal, on products it uses where their output in that area exceeds 20,000 tons yearly. Such products are produced at such important plants as those of the National Steel Corp., producer of sheets, strips and bars, commodities used in large volume by the automotive industry.

It does not necessarily follow, however, that the prices would be lowered, though ostensibly the purpose is to stimulate competition and to eliminate cross hauls, or so-called artificial freight. The new base prices obviously would still carry differentials over

(Turn to page 377, please)

New Passenger Car Registrations—January, 1935

	January, 1935	December, 1934	January, 1934	Per Cent change Jan., 1935 over 1934	Per Cent of Total January	1934
Ford	46,306	14,209	25,828	+ 79.4	33.89	42.17
Chevrolet	26,549	25,756	7,223	+267.0	19.43	11.79
Plymouth	24,873	11,903	9,679	+157.0	18.20	15.80
Dodge	8,978	3,968	3,960	+126.5	6.57	6.47
Pontiac	5,864	2,144	2,363	+148.0	4.29	3.86
Oldsmobile	4,453	2,146	557	+699.0	3.26	.91
Buick	4,240	3,857	2,738	+55.0	3.10	4.47
Terraplane	3,010	1,850	797	+277.5	2.20	1.30
Studebaker	2,677	2,113	2,242	+19.5	1.96	3.66
Chrysler	1,924	1,348	450	+327.5	1.41	.73
Hudson	1,317	902	122	+980.0	.96	.20
De Soto	1,261	484	500	+152.0	.92	.82
La Fayette	851	712	...	...	.62	...
Nash	833	663	1,468	- 43.2	.61	2.40
Graham	596	612	453	+ 31.7	.44	.74
Hupmobile	552	640	292	+89.1	.40	.48
Auburn	486	383	434	+ 12.0	.36	.71
Packard	431	481	349	+23.5	.32	.57
La Salle	369	279	69	+435.0	.27	.11
Cadillac	297	259	183	+62.3	.22	.30
Willys	267	253	506	- 47.4	.20	.83
Reo	228	234	208	+ 9.7	.17	.34
Lincoln	115	97	112	+ 2.7	.08	.18
Pierce-Arrow	50	99	99	- 49.4	.04	.16
Miscellaneous	108	122	610	- 82.3	.08	1.00
Total	136,635	75,514	61,242	+ 81.0	100.00	100.00
Chrysler Corp.	37,036	17,703	14,589	+154.0	27.10	23.82
Ford & Lincoln	46,421	14,306	25,940	+224.0	33.97	42.35
General Motors	41,772	34,441	13,133	+21.3	30.57	21.44
All Others	11,406	9,064	7,580	+25.8	8.36	12.39

Supreme Court Snag Halts Spielman Case

Hughes Questions Right of Lower Court to Act; Ask Written Arguments

The long awaited presentation in the United States Supreme Court of the arguments for and against the validity of the automobile dealers' code was halted practically before it was started in the court on March 11. Counsel for the Spielman Motor Sales Company was permitted to proceed with his arguments only a few minutes when Chief Justice Hughes interrupted to raise questions as to whether or not the lower court really had any right even to consider a petition to enjoin threatened prosecution against a dealer for refusing to live up to the trade in allowance provisions of the code.

Counsel for the dealer and also for the government were requested to present to the court written arguments by April 8 as to the jurisdiction of the lower court under the law which grants to a three judge federal court the power to enjoin the enforcement of a state or federal law or order of a regulatory commission. The announcement of the court also indicated that there was some doubt as to whether the complainant sought the right remedy in asking for an injunction instead of standing trial for an alleged violation of the code and raising as a defense the same arguments presented in seeking an injunction to prevent enforcement of the code provisions.

When the U. S. Supreme Court gets around to listening to the arguments in the Spielman case, and, subsequently to render its decision, several possibilities are apparent.

The Court could—

- (1) throw the case out on technical jurisdictional grounds, which might make it necessary to bring before the court a case where there has been an actual conviction.
- (2) decide that the dealers' code is valid as

to ordinary transactions where there is a state supporting law, properly enacted.

- (3) hold that, where there is no state law, the code can be effective only when interstate commerce is clearly shown in particular transactions.
- (4) approve the NIRA and the dealers' code in toto without the necessity of a state law.

or,

- (5) declare that the business of selling automobiles at retail and giving a trade in for a used car is not so affected with a public interest—in the legal or constitutional sense—as to deprive a business man of the right to sell a car for any price he sees fit, or give it away, and, at the same time, make any kind of a trade in allowance.

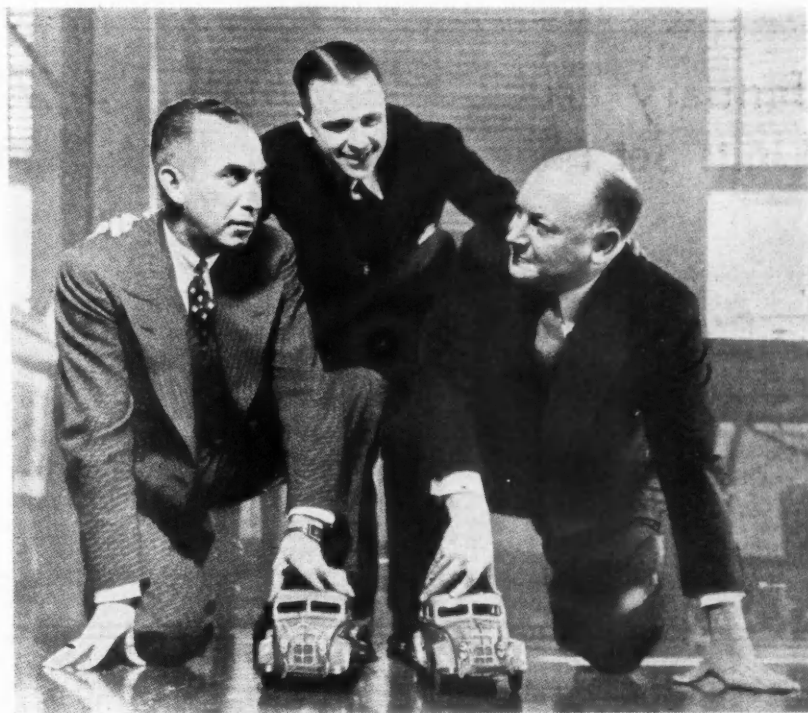
CO Poisoning Held to Be Real Cause of Many "Sleeping Driver" Accidents

Many accidents involving motor vehicles on the highways has been found to be the presence of a dangerous amount of carbon monoxide mixed with the air breathed by drivers, according to F. M. VanDeventer, of the Cities Service Company, who described his experiments to the Metropolitan Section of the S.A.E. in an unusually interesting talk last Monday.

After explaining the effects of carbon monoxide in the blood, Mr. VanDeventer stated that only three parts of carbon monoxide in ten thousands parts of air are enough to cause a 30 per cent blood saturation if this mixture is breathed for an hour. A concrete illustration of this proportion is a tumblerful of CO mixed with the air in the average two-passenger coupe. A number of cars which had been involved in accidents caused by their drivers falling asleep were tested by Mr. VanDeventer, when the condition of the cars after the accidents permitted such tests. The cars were operated under conditions similar to those be-

fore the accidents, with the carbon monoxide indicating apparatus in the cars, and the drivers protected by gas masks. In every case so tested, it was found that the proportion of CO was far above the danger point, and in some cases amounted to forty-parts in ten thousand of air. Fifteen parts in ten thousand, if breathed for an hour, cause death.

The first step toward eliminating carbon monoxide from air breathed by drivers is to make sure that combustion is as near perfect as possible. The next step is to make sure that exhaust gases cannot enter the bodies. The commonest source of CO within a car is, however, from defective exhaust manifolds or mufflers, Mr. VanDeventer said. Exhaust leaks under the hood or the floor-boards inevitably poison the air inside the car whenever there are openings in the body or floor. Exhaust manifold leaks are especially difficult to locate. "A gasket is cheaper than a casket," said Mr. VanDeventer in urging thorough and frequent examinations of exhaust systems.



E. G. Peed, Chrysler vice-president (left), and J. W. Frazer, another Chrysler v.p. ready to test their chosen cars in a sales contest. The official starter in the center is Burch E. Greene, advertising and sales promotion manager for Chrysler and DeSoto. The photograph was made to symbolize the start of a sales race between the central and eastern divisions of Chrysler-Desoto-Plymouth group headed by Mr. Peed and Mr. Frazer respectively.

Lansing Employs 15,000 to Meet New Car Demand

Lansing industrial employment passed the 15,000 mark this week as automotive plants continued to increase their forces in an effort to keep up with an increasing demand from dealers. The figure is more than 2000 ahead of the corresponding period of 1934, and is nearly up to the high peak of last year which was reached in May.

Graham-Paige

The Graham-Paige Corp. reports a net loss of \$474,959 for 1934, after taxes, depreciation and all other deductions which compares with a net profit of \$66,997 in the previous year.

January Truck Sales Totaling 34,759 Units Set New Record for That Month

	January, 1935	December, 1934	January, 1934	Per Cent Change— Jan., 1935 over 1934	Per Cent of Total January, 1935	1934
Ford	13,260	6,374	6,650	+ 99.2	38.15	29.05
Chevrolet	9,867	7,946	8,917	+ 10.3	28.39	38.93
Dodge	5,141	4,656	2,581	+ 99.1	14.79	11.27
International	3,513	2,508	2,284	+ 54.0	10.11	9.97
G. M. C.	858	754	555	+ 54.5	2.47	2.42
Diamond T	550	365	406	+ 35.5	1.58	1.77
Reo	380	356	289	+ 31.6	1.09	1.26
White	281	253	204	+ 37.8	.81	.89
Federal	152	139	120	+ 9.4	.44	.52
Studebaker	127	125	98	+ 29.8	.37	.43
Mack	114	98	161	+ 29.2	.33	.70
Brockway	86	70	91	+ 5.5	.25	.40
Autocar	71	77	79	+ 10.1	.20	.34
Stewart	42	42	61	+ 31.1	.12	.27
Austin	35	44	62	+ 43.5	.10	.27
Terraplane	29	38	8	+ 263.0	.08	.03
Buick	28	16	8	+ 250.0	.08	.03
Indiana	27	30	80	+ 66.2	.08	.35
Miscellaneous	198	234	249	+ 20.5	.56	1.10
Total	34,759	24,125	22,903	+ 51.6	100.00	100.00

GM Stockholders Gain in 1st Quarter Over '34 Close

General Motors common and preferred stockholders totaled 350,663 for the first quarter of this year which compares with 350,164 in the closing quarter of 1934 and 351,949 during the first three months of last year.

The latest report indicates there are 331,197 holders of the corporation's common stock and the balance of 19,466 are preferred stockholders. Preferred stockholders are listed as of Jan. 7 record and the common stock count was taken as of Feb. 14, 1935.

Reo Building Modern Super-Service Station

A modern super-service station is being built in Detroit under the direction of John F. Collier, for 16 years in charge of Reo service in that city. Motorists will be able to drive directly into the main service floor of the building from the street level through a 20 foot entrance. The main floor will extend back 250 feet from the front building line and at the rear will be a large con-

crete paved area for storing trucks and similar vehicles.

The front of the building will be decorated in contrasting black and ivory macotta fired on steel. A 50 foot octagonal tower will surmount the building with the name Reo in neon letters imposed on all sides. Extending eight feet over the sidewalk will be a massive canopy.

Plymouth Adds Business Sedan Listing at \$570

A new four-door business sedan model priced at \$570, has been added to the Plymouth line. The new model is in production and deliveries will start shortly.

The addition of the new job brings the total of Plymouth body models to nine including six deluxe types and three in the "business" series.

Alberta Gas Tax Up 1c.

An increase in the tax on gasoline from six to seven cents in the Province of Alberta is announced. It is expected the increased tax will yield the Province \$450,000.

Green Displays Pique at AMA Conference Refusal

"In my judgment the automobile workers will be disappointed and resentful because of Mr. Reeves' reply, though it came as no surprise," said William Green, president of the American Federation of Labor, last Friday, in commenting on the letter addressed to him on behalf of the Automobile Manufacturers Association by Alfred Reeves, vice-president, in which the latter refused the Federation's request for a conference.

Mr. Green added that Mr. Reeves' reply would be interpreted as a refusal on the part of the automobile manufacturers to accept the former's invitation. The next step, he stated, will be to acquaint Francis J. Dillon, chief organizer for the Federation in the automobile industry, with the reply.

The Reeves letter, said Mr. Green, represents the characteristic attitude automobile manufacturers have assumed from the beginning. The automobile people, he said, cling to a board that has lost the confidence of the workers, while on the other hand the big rubber manufacturers are refusing to abide by the decisions of the NRA.

"I accept this argument of the manufacturers in support of the Automobile Labor Board as confirming our charge that the board is serving the interests of automobile manufacturers."

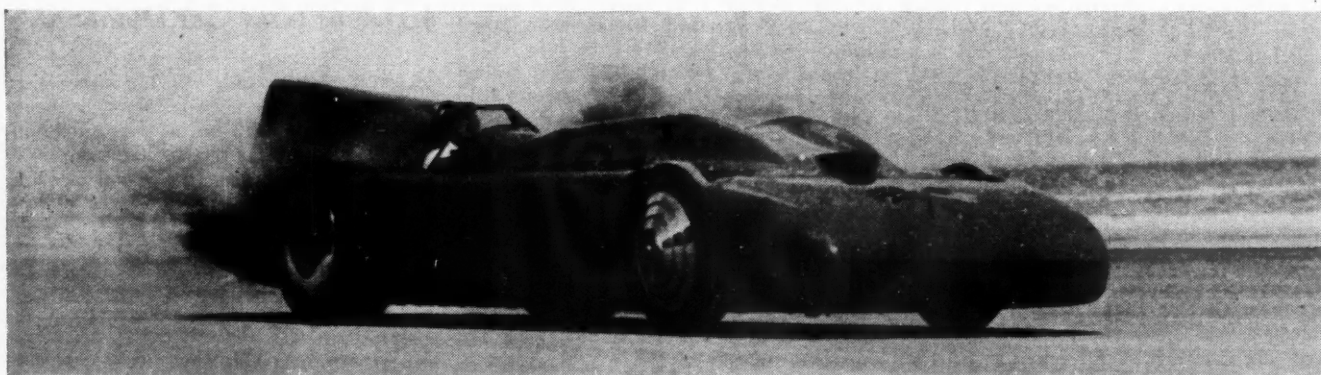
Chevrolet Promotes James

The appointment of D. L. James as assistant manager of the service and mechanical departments of Chevrolet Motor Co., has been announced by W. E. Holler, general sales manager. Mr. James, who has been service development manager will continue in the central office at Detroit under C. W. Wood, manager.

Electric Storage Battery

The Electric Storage Battery Co. reports a net profit of \$2,004,404 for 1934, which compares with \$2,022,206 for the previous year. The company's current position as of Dec. 31 was:

	1934	1933
Current assets (Inc. \$4,156,865 cash).....	\$24,044,294	\$23,690,572
Current liabilities.....	1,361,518	972,324
Working capital	22,682,776	22,718,248



Sir Malcolm Campbell driving his Bluebird on the beach at Daytona, Fla. Last week the British speedster set a new world's speed record with a mark of 276.816 m.p.h. Sir Malcolm had said he would try to hang up a record of 300 m.p.h.

LOF Now Producing Heat-Treated Glass

Manufacture Going On Under Licenses From French Patent Holders

A heat-strengthened glass, said to have four to six times the strength of ordinary plate, is now being made by the Libbey-Owens-Ford Glass Co. at its plants in Toledo and Ottawa, Ill. The new product is covered by French owned patents and is being produced by the LOF organization under license.

The glass must be completely prepared to size and finished before it is heat treated. When it does break under heavy impact or severe twisting or bending it lets loose an internal tension which reduces it to a mass of crystals about like rock candy in form.

The product withstands severe tests of all kinds. A few days ago they stood a current model Ford car on four pieces the size of windshields supported by bricks. The glass bent considerably but did not break. It will twist. Hot lead can be poured on a piece of the glass resting on a cake of ice and the glass will not crack, it is reported.

It is already being used by the United States Navy for port holes on battleships, reducing weight and increasing strength. Officials do not believe that it will replace laminated glass in certain uses but it may prove useful in some windows of a motor car.

The glass is really case-hardened. A piece of ordinary plate glass completely finished as to size, holes bored, edged and polished is put in a special electric furnace and heated to very near the plastic state. It is then subjected to blasts of relatively cold air. This forms a tough outer skin with tendency to contract against the outward tension of the interior glass.

F. S. Blackall, Jr., Heads Tool, Die, Machine Men

Officers of the Special Tool, Die & Machine Shop Institute and members of the code authority of the industry were elected at the recent annual convention of the Institute held at the Hotel Statler, Cleveland. The officers are F. S. Blackall, Jr., president, Taft-Peirce Mfg. Co.; vice-president, H. A.

As the tires on Sir Malcolm Campbell's Bluebird appeared after his recent record breaking run on Daytona Beach, Fla. The English speed king examines the result of his 276.816 m.p.h. on the sandy shore.



Stoddard, Interstate Mechanical Laboratories; treasurer, G. A. Barth, Barth Stamping & Mfg. Co.; secretary, George J. Huebner.

Roy T. Wise, who had been executive secretary of the industry's code authority, resigned this post to become associated with the Ex-Cell-O Aircraft & Tool Corp. Mr. wise was named chairman of the code authority and George J. Huebner was named executive chairman. Other members are H. A. Stoddard, vice-chairman; F. S. Blackall, Jr., Miles Irmis and C. R. Quine.

Canada May Fix Gasoline Specification Standards

Specifications for grades of gasoline will be studied by representatives of Canadian provincial governments together with the National Research Council. The conference will open next week in Ottawa, Ont. The lead in this matter was taken by Nova Scotia last year.

The Ontario government, assisted by the Council, drew up specifications for gasoline sold within the province and made it mandatory upon producers and distributors to maintain the standard established. It was understood, the statement added, New Brunswick was contemplating acceptance of standards for gasoline grading which would be acceptable to the other provinces.

Revamped P-A Preferred Stock Oversubscribed

Federal Judge John Knight sitting in the U. S. District Court at Buffalo set March 25, as the date for the final hearing on the reorganization plan of the Pierce-Arrow Motor Car Co. The reorganization plan, John Lord O'Brian, counsel for the company, told Judge Knight contemplates the production of 1770 cars per year and that at this rate of output the net earnings will be 10 times greater than required for dividends on the \$250,000 worth of preferred stock to be issued under the plan, and which already is oversubscribed. A step-up of 300 cars would increase earnings 20 times the requirement, the attorney stated.

A \$1,000,000 loan has been arranged for through the Federal Reserve Bank and the Marine Trust Co. and the majority of creditors have approved the plan, the court was informed. Creditors of Pierce-Arrow will receive 120,000 shares of the new \$5 common stock of the reorganized company.

"Lifeguard" Tube Offered by Chrysler as an Extra

The new "lifeguard" tube, recently introduced by the Goodyear Tire and Rubber Co., is now available at extra cost on all Chrysler, DeSoto, Dodge and Plymouth models.

January Retail Dollar Volume Double Last Year

U. S. New Car Registrations and Estimated Dollar Volume by Retail Price Classes—January

	UNITS				ESTIMATED DOLLAR VOLUME			
	1935	1934	Per Cent Change.	Per Cent of Total	1935	1934	Per Cent Change.	Per Cent of Total
Chevrolet, Ford and Plymouth	97,728	42,730	+129.0	71.59	\$61,600,000	\$25,500,000	+142.0	62.97
Others under \$750	18,021	6,110	+194.0	13.20	13,000,000	4,200,000	+209.5	13.50
\$751-\$1,000	15,870	7,345	+116.0	11.62	13,500,000	6,000,000	+125.0	14.02
\$1,001-\$1,500	3,292	3,463	-5.0	2.41	4,100,000	4,100,000	None	4.26
\$1,501-\$2,000	719	797	-9.8	.53	1,200,000	1,400,000	-14.3	1.25
\$2,001-\$3,000	552	532	+3.9	.40	1,500,000	1,500,000	None	1.56
\$3,001 and over	345	218	+58.1	.25	1,400,000	900,000	+55.5	1.44
Total	136,527	61,195	+123.0	100.00	\$96,300,000	\$43,600,000	+121.0	100.00
Miscellaneous	108	47						
Total	136,635	61,242						

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

The rate of general business activity appeared to be well maintained last week, although some branches of industry failed to report the expansion that is usually witnessed at this season of the year. Retail trade, in line with the tendency for some time past, continued to make a better showing than industry in general.

Car Loadings Fluctuate

The movement of railway freight remained slightly below last year's level during the week ended March 2. Loadings during that period totaled 604,642 cars, showing an increase of 51,746 cars, or 9.4 per cent, over the total for the preceding week, which contained a holiday, but a decrease of 1,075 cars, or 0.2 per cent, from that for the corresponding period last year.

Current Output Levels

Production of electricity by the electric light and power industry for the week ended March 2 continued to show a gain over last year's figures, although the advance was smaller than those reported in the weeks immediately preceding. Output during that period exceeded the total for the corresponding period last year by 4.6 per cent, as compared with a gain of 5.0 per cent reported a week earlier, 7.3 per cent two weeks earlier, and 6.8 per cent three weeks earlier.

Heavy Lumber Shipments

Shipments from lumber mills during the week ended March 2 were the heaviest reported so far this year and were 22 per cent above those in the corresponding period a year ago. New business compared well with that for preceding weeks and was 9 per cent above that booked a year earlier.

Crude Production Slumps

Average daily crude oil production for the week ended March 2 amounted to 2,473,850 barrels, showing a decline of 62,350 barrels from the output for the preceding week and coming well within the Federal allowable figure of 2,520,300 barrels, which became effective March 1. Average daily output a year ago was 2,183,300 barrels.

Fewer Business Failures

Business failures last month showed slight reductions from the January figures, both in the number of insolvencies and the amount of liabilities involved. Failures last month totaled 1,005, as against 1,184 in January and 1,049 in February last year.

Fisher's Index

Professor Fisher's index of wholesale commodity prices declined for the third consecutive time during the week ended March 9. The current figure is 81.8, as against 82.0 a week earlier, 82.2 two weeks earlier, and 82.4 three weeks earlier.

Federal Reserve Statement

Federal Reserve bank credit outstanding increased \$2,000,000 during the week ended March 6. The monetary gold stock rose \$22,000,000 and money in circulation \$36,000,000, while member bank reserve balances declined \$33,000,000.

Chapin, president of the National Acme Co.; R. M. Fisher, treasurer of the Midland Steel Products Co.; David L. Johnson, Cleveland attorney; W. A. McAfee, attorney; E. J. Quintal, of the Chase National Bank, New York; W. King White, president of Cleveland Tractor Co.

Former directors, not renamed, include T. R. Dahl, G. H. Kelly, J. H. Watson, A. J. Rumpf, and J. S. Condit.

Hayes Body Corp.

A net loss of \$121,670 for 1934 as compared with \$288,382 for 1933 has been reported by the Hayes Body Corp. This year's loss is reported exclusive of \$310,654 charged to surplus to cover every possible loss in realization of accounts receivable and securities. On Dec. 31 the company's current position was:

	1934	1933
Current assets (Inc. \$46,491 cash) ..	\$341,725	\$209,934
Current liabilities...	275,180	197,523
Working capital....	66,545	12,411

Briggs & Stratton

Briggs & Stratton Corp. reports a net profit of \$640,480 for 1934, which compares with \$252,067 for the previous year. During the year the company's dividend disbursements amounted to \$430,865. As of Dec. 31 the corporation reported its current position as:

	1934	1933
Current assets (Inc. \$379,501 cash) ..	\$2,431,704	\$1,997,157
Current liabilities...	404,368	221,784
Working capital....	2,027,336	1,775,373

Detroit Steel Prod. Co.

The Detroit Steel Products Co. reports a net profit of \$152,782 for 1934 against a net loss of \$198,799 for 1933. On Dec. 31 the company's current position was:

	1934	1933
Current assets (Inc. \$185,969 cash) ..	\$1,661,891	\$1,275,946
Current liabilities...	966,696	693,234
Working capital ...	695,195	582,712

Seagrave Corp.

The Seagrave Corp. reports a net loss of \$90,727 for 1934 against \$93,443 for 1933. On Dec. 31 the company reported its current position as:

	1934	1933
Current assets (Inc. \$114,308 cash)	\$663,868	\$689,068
Current liabilities	153,147	39,054
Working capital	510,721	650,014

Plymouth to Exhibit at Better Housing Show

The Plymouth Motor Corp. is to have a special exhibit of current models at the Better Housing and Home Building Modernization Exposition sponsored by the Federal Housing Administration, to be held in the Port Authority Commerce Building, New York, from March 25 to March 31.

Boehm Succeeds Saybolt

A. B. Boehm has succeeded J. W. Saybolt in handling sales of automotive and industrial lines of lubricants in the fields of the four companies comprising the Esso Marketers group. Mr. Saybolt has succeeded R. T. Haslam as manager of the lubrication

sales for Standard Oil of New Jersey, Pennsylvania, Louisiana and the Colonial Beacon Oil Co. Mr. Haslam has been appointed general sales manager of the four companies.

Bean, Hoffman, Vance Renamed White Directors

Only three members of the former directorate of the White Motor Co. were re-elected when stockholders met last week to name directors for the next three years. The reelected members are A. G. Bean, president of the company; Paul G. Hoffman, Studebaker president; and Harold S. Vance, chairman of the Studebaker board.

Other newly named officials are F. H.

E. R. Grace & A. F. Bement Form Advertising Agency

Edward R. Grace, president of Grace & Holliday since its inception in 1922, and Austin F. Bement, formerly president of the agency bearing his name for many years in Detroit, have announced the formation of a new national advertising agency, Grace & Bement Incorporated, with headquarters in the New Center Bldg., Detroit.

Need for Administrative Flexibility Urged as Congress Wrestles with NIRA

by L. W. Moffett

Washington Correspondent,
Automotive Industries

WASHINGTON, March 14.—Willingness of the administration to permit Congress to write virtually its own NRA ticket, provided administrative flexibility is assured, has given the impression that high officials have perceptibly lost their enthusiasm over that alphabetical agency and prefer to let Congress assume the responsibility for its future.

Broad outlines of the administration program have been laid before the Senate Committee on Finance by Donald Richberg, director, National Emergency Committee, but they leave much room for changes which Congress may see fit to make in extending the act.

Two years of experimentation plainly have shown that NRA took in more territory than it could possibly govern, despite the enormous bureaucracy set up in Washington. Tacit admission that this is so is seen in the suggestion of Mr. Richberg for elimination from the act of service codes. Attempts to enforce compliance with provisions of these codes have utterly failed. The same is true of some of the retail codes and to a lesser degree it is true of many other codes, compliance being dependent more upon the support of the codes given by the affected industries themselves than upon NRA itself.

On the other hand, it is widely conceded that basic principles of the act are sound. These relate to standards of minimum wages and maximum hours and fundamental trade practices. These provisions obviously will be continued no matter what other modifications may be made in the act. The same is true of Section 7-a, which Mr. Richberg has asked to be left in its present form with a request for a legislative statement of general principles to be defined administratively as is suitable to specific cases as they arise. For either industry or labor to think or to affect the belief that it can write its own specification for this highly controversial section is idle. This is said despite organized labor's renewed efforts to compel enactment of the Wagner Labor Disputes bill on which hearings were begun Monday. However, despite NLRB support, the administration appears to be opposed to this bill, although it has not officially gone on record one way or the other with regard to it.

Contraction of NRA activities by limiting them to interstate commerce, as suggested by Mr. Richberg, long has been seen as an inevitable. Mr. Richberg also has suggested definition of the anti-trust laws for the purpose of legalizing certain code provisions that are recognized as restraint of trade. At the same time this suggestion, designed to prevent unfair trade practices, is coupled with another to prevent so-called monopolistic practices. In this category comes the storm habitually raised in Congress and now again revived, about alleged suppression of small business and granting of monopolistic powers to big business. Codes of the larger industries again are being attacked vigorously by an element in Congress on this score, though actually in some of the industries there exists a greater desire on the

part of the smaller than the larger units for continuance of codification. The administration recommendations apparently were made for the purpose of softening these attacks, led by some who insist NRA ought to be scrapped.

Senator King is especially active in urging its scrapping both at the hearings before the Finance Committee and on the floor of the Senate. Senator Borah of Idaho, who would retain only the labor provisions, and Senator Nye of North Dakota are also prominent leaders in attacks on NRA, and have been joined by the conservative Senator Glass of Virginia, in assailing NRA as promoting monopoly and suppressing small enterprise. They want the anti-trust laws restored to full force. Some of them too, would like to see only the basic principles of NRA retained and its operation transferred to the Federal Trade Commission, a proposal strongly opposed by Mr. Richberg.

NRA itself has made it clear that it proposes to prohibit price fixing and other practices which have been the object of widespread criticism, though exceptions as to price fixing will include natural resource industries. It is also said to be in mind, as a matter of greater compliance, to permit certain agreements to members adhering strictly to codes but to withdraw such privileges if agreements are not carried out, or further, if in urging certain revisions the administration finds industry will not accede to its demands. In short the new character of NRA is going to depend not solely upon any modifications that may be made in it by Congress but by its future administration. There are reports that the administration may resort to a greater extent than it has in the past to its power either to revise codes or to withdraw them entirely as a means of having them shaped more to its liking.

It is doubted that this policy would be pushed except at points where the adminis-

tration considers only fundamental principles are involved. For the trend is away from compulsion and toward greater voluntary cooperation on the part of industry. It is readily seen that unless there is a wider spirit of cooperation, NRA, almost bogged down to the breaking point, cannot possibly survive. Court decisions also possibly have been a factor in developing this trend for some of them have sharply reprimanded the government for meddling in industry and business and have bluntly declared that it has exceeded its power, both as to jurisdiction over industry and over State laws.

Organized labor is renewing its fight, as NRA legislation approaches, for greater representation of the National Industrial Recovery Board, and for equal representation on code authorities. If given decisive support in Congress it may readily be seen the opposition that industry would develop to any extension of NRA, especially as to representation on code authorities. Some industries, it is reported, though realizing many benefits from NRA, and the confusion that would probably result temporarily at least from its abandonment, would rather see the latter development than to share code administration with organized labor. Nor would they be affrighted by threats that scrapping of NRA would mean enactment of the 30-hr. week bill. They do not share that view.

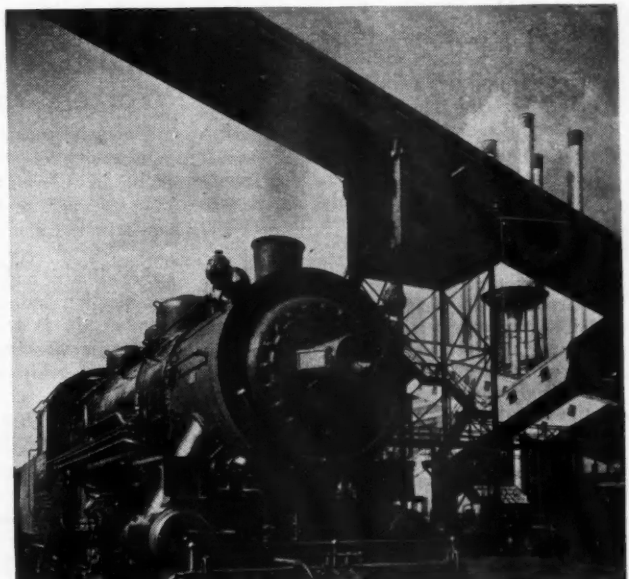
U. S. Tin Consumption In '34 Dropped 25.8%

Consumption of tin in the United States dropped 25.8 per cent in 1934 below the 1933 level, according to the International Tin Research and Development Council. The total U. S. consumption of tin in manufacture for the past year was 53,940 tons against 61,440 tons in 1933. World consumption during 1934, according to the Council, was 130,000 tons compared with 134,000 tons during the previous year.

Ford of Germany

The Ford Motor Co. of Germany has reported a net profit of 8,120,000 Reichmarks for 1934 which compares with a 3,660,000 Reichmark net profit in 1933.

Has the automobile dealt the railroads an economic KO blow? Check the facts! In February alone at the Ford Rouge plant freight movement into and out of the plant exceeded 30,000 cars, greater than the previous movement of April, 1930. This traffic necessitated the hiring of 10 additional locomotives to supplement the fleet of 12 in constant service to handle the volume. January's traffic totaled 27,000 cars.





Chevrolet employees in the Flint plant vote for collective bargaining representatives in an ALB sponsored election. Late reports indicate approximately 90 per cent of eligible automotive workers have participated in these elections.

Industry Stands on ALB Election Returns

(Continued from page 369)

association, not being an employer of automobile workers, "has no occasion to carry on collective bargaining." While not to its liking, the Reeves reply was pretty much in line with union expectations.

Having repudiated the Wolman Board, the Federation contends that the strike vote now being taken by automobile workers affiliated with the A. F. of L. represents the only avenue left by which these workers may adjust or correct their grievances. By Wednesday last only 15 of the 176 A. F. of L. locals had been heard from, but Mr. Dillon expects that returns will be coming in at a faster rate within the next week or two and that before April 1 the Federation will have the necessary data on which to base its decision on whether or not to call a strike. Results of the vote will not be disclosed until tabulation is completed or sufficient returns have been received by Detroit headquarters of the union to decide the issue.

Mr. Dillon intimated the possibility of concerted action by workers in the automobile and rubber industries. He has been invited to address rubber workers in Akron, Sunday, and to confer with officers of the United Rubber Workers Council "concerning strategy to be utilized in the general movement of workers within the automobile and rubber industries during the impending crisis." He said that rubber workers were to present demands to their employers during the coming week.

Referring to the AMA reply to Mr. Green's letter, Mr. Dillon said, "Would Mr. Reeves agree to deal with Mr. Green if under a government supervised election conducted by the National Labor Relations Board the results substantiated our contention that Mr. Green speaks for the majority? We are prepared to enter such an election and to abide by the decision of the automobile workers." One of the Federation's most emphasized grievances in connection with ALB elections is that they are held in the plants, "under the eyes of the bosses."

Despite the confidence expressed by A. F. of L. leaders, there has been no change in feeling among Detroit manufacturers regarding the labor situation. They derive assurance from the A. F. of L.'s poor showing in the ALB elections in which the

employers have implicit faith as giving true expression to the workers' preference for representatives in collective bargaining. Employers are not disposed to minimize the disturbing effect of a strike call by the Federation but they foresee small chance of success or of serious interruption of operations.

Confidence of the workers in the ALB elections is indicated by the fact that almost invariably the vote in the final elections is slightly higher than in the primaries. The only exception has been in one plant where certain departments were closed on final election day and not all workers who participated in the primary returned to the plant to vote. As further indication of the workers' endorsement of the ALB plan for selecting representatives, it is noteworthy that the final elections showed scarcely any blanks, whereas in the primaries two and one-quarter per cent of the votes were blank. Interest is heightened in the final election by the campaigning of opposing candidates.

W-O Begins Production of 6100 Cars March 23

Toledo's automotive employment declined about 400 workmen last week, indicating a slight recession or catching up with orders in many plants.

The Willys-Overland Co. force has been cut to 850 men due to the completion of the first 5,000 units of its production program. Cars in the second group of 6,100 units are scheduled to start off the lines about March 23. Orders from foreign dealers are increasing.

Fisher Cleveland A.F.L. Workers Vote to Strike

Unofficial reports of the A. F. of L. strike vote among employees of the Fisher Body plant in Cleveland, indicated that more than 90 per cent of the union members voted in the affirmative for a strike. However, recent returns from the Automobile Labor Board conducted collective bargaining election indicates that the A. F. of L. membership is but a fraction of the 8000 employees working in the plant. The actual membership is said to be 1000.

The report of the workers' vote came from John C. Barskites, financial secretary of Automotive Workers Federal Union, No. 18,614. This vote at the Fisher plant is the second in the Cleveland district which is said to be favorable to an A. F. of L. Strike; the other was voted by the union workers at the White Motor Co. While the

Fisher vote empowered the shop committee to call a strike at any time no such action, it was intimidated by union officers, will be taken without orders from Detroit headquarters. Mr. Barskites is reported as saying that no strike will be called "until we get word from Detroit to go ahead."

Electric Auto-Lite Co.

The Electric Auto-Lite Co. reports a net profit of \$1,212,135 for 1934 which compares with \$684,372 for 1933. The company reported its current position as of Dec. 31 to be:

	1934	1933
Current assets		
(Inc. \$2,115,147 cash) ..	\$8,930,964	\$5,406,943
Current liabilities	2,409,895	888,149
Working capital	6,521,069	4,518,794

Gabriel Co.

A net loss of \$140,759 for 1934 has been reported by the Gabriel Co. This compares with a net loss of \$130,620 in 1933. As of Dec. 31 the company reported its current position as:

	1934	1933
Current assets		
(Inc. \$25,690 cash)	\$312,999	\$365,691
Current liabilities	46,214	42,989
Working capital	266,785	322,702

McQuay-Norris Co.

After taxes, depreciations and other charges the McQuay-Norris Manufacturing Co. reports a net profit of \$478,580 for 1934 which compares with a \$376,775 net profit in 1933.

F. E. Brown Seriously Ill

Frank E. Brown, quality engineer of the Warner Gear Co., Muncie, Ind., was stricken on March 3 at his home with a severe heart attack. It is expected that he will be away from his work for six to eight weeks.

Bartholomew Joins Eaton

John Bartholomew has joined the sales organization of the Eaton Manufacturing Co. Mr. Bartholomew previously was with Bendix Products.



S. A. Jefferies

whose appointment to the position of chief engineer of Stutz has just been announced by Col. Edgar S. Gorrell, Stutz president. Until recently Mr. Jefferies has been engaged in research work with Reo.

Current Retail Sales at 2,700,000 Annual Rate

(Continued from page 369)

by a number of companies doubtless will carry right through the spring season.

Plymouth retail sales are running well ahead of the 1934 volume. With 7572 cars delivered during week ended March 9, Plymouth showed a 4 per cent gain over the preceding week and 14.4 per cent over the corresponding week of 1934. It brought Plymouth's domestic retail volume for the first 10 weeks of this year to 61,281 cars, which compares with 34,869 in the similar period of last year. Shipments during the week of March 9 totaled 9279 against 8318 cars in the preceding week, an increase of 11.6 per cent.

Olds again set a new retail sales record in February when dealers delivered 10,968 cars, more than double the January volume; a four-fold increase over February of last year, and 500 more cars than were sold in the previous record February.

DeSoto retail deliveries have increased every week for ten consecutive weeks this year and are now running far ahead of the peak buying season of last year. For the week ended March 9 they totaled 574 against 485 for the preceding week, bringing the 10 weeks' total for this year to 3514, which compares with 593 for the corresponding period of last year. DeSoto began shipping its 1935 models in December, getting out 2381 new cars that month, 4438 in January and 5090 in February, or a total of 11,909 units up to March 1, which compared with 16,242 in all of 1934.

Pontiac, which delivered 7390 cars in January against 2584 in January of last year, jumped to more than 10,732 for February, exceeding any month in 1934. H. J. Klingler, president of Pontiac, expects to have at least 130,000 and perhaps 150,000 new Pontiacs on the road by the end of the year. The company built 16,000 cars in February and will probably get out over 18,000 this month and should be doing even more to keep up with the growing demand.

Dodge dealers during the week of March 9 delivered 3808 Dodge passenger cars, 2169 Plymouths and 983 trucks, a total of 6960 units, compared with 6727 in the preceding week, an increase of 3.5 per cent. The three-millionth Dodge came off the assembly line Tuesday, March 12.

NRA Proposes Mill-Group Basis for Steel

(Continued from page 370)

those now prevailing at established base points such as Cleveland and Youngstown, Ohio; Chicago and Pittsburgh from which the automotive industry draws large supplies of steel.

The Trade Commission report, like previous reports it has made on the basing point system in the steel industry, is scorching in its attack on the system as a price fixing device. It attacks many provisions of the steel code as amended. Among other things it denies that the increase in basing points under the amended code has developed competition. On the contrary, it says some of the amendments to the code have tended to make price fixing even more effective and "others heralded as restraints upon price fixing no real value as such."

It declares there is no difference in principle between a single and a multiple basing point system and "so long as the power exists to control relative prices at the dif-

ferent basing points any benefits from additions to the number of such points may become wholly illusory. Moreover, when the so-called multiple basing point system is analyzed, it is found to consist of an aggregation of single point systems, each controlling the delivered price in its own territory. On certain important steel products several single point systems each dominate the delivered price within separate sections, which are each so large as to be composed of numerous states."

It is also charged the code as preventing ultimate consumers from receiving either the actual or potential use of water transportation. Another artificial element in the price structure, the Commission said, is the 65 per cent freight allowance from the delivered price when the shipment is made by truck.

"If the buyer wishes to take delivery by truck from basing point mills," says the Commission, "he cannot buy at the basing point price, but must add to that price 35 per cent of the all-rail carload freight, although the trucking charge may be as high as such all-rail freight."

In anticipation of the NRA-Federal Trade Commission reports, the American Iron and Steel Institute has issued a statement strongly endorsing the existing basing point method of quoting prices. The statement was taken to indicate that the industry will vigorously oppose a change, either to the NRA or the Commission plan.

The Institute statement is based on a survey it has had under way for some time among members of the steel code, designed to determine their attitude toward the basing point method of quoting prices. The Institute statement said that 184 members, which together represent 97.4 per cent of the ingot capacity and 97.2 per cent of the finishing capacity of the industry, expressed opinions in favor of continuing the basing point method of quoting prices.

From a study of the facts, the report said, the conclusion is clear that any action seeking to disturb the practice of quoting prices for steel products according to the long established basing point method would have the following results:

"1. It would seriously decrease production in some of the largest producing centers, such as Pittsburgh and Youngstown.

"2. It would tend to increase production at plants that are favorably located in or near the larger centers of consumption.

"3. Through the shifting of division of business it would cause a prompt shifting of demand for labor and instead of increasing employment it would have the opposite effect.

"4. It would localize the relations of producers and consumers of steel products and thereby lead to the dismantling of plants so located that they could no longer reach the markets on which their business had been built, with attendant loss to the owners and permanent destruction of employment for steel workers in those places.

"5. It would deprive the purchaser of steel products of the advantages of several sources of supply at competitive prices, and put him generally at the mercy of the nearest mill."

Richberg Would Abandon 500 Smaller NRA Codes

Several Automotive Codes Included on List—Would Cut Overlapping Problems

Elimination of some 500 codes for industries employing less than 10,000 persons, was recommended to the Senate Finance Committee this week by Donald R. Richberg. With his recommendation, Mr. Richberg submitted a list of 286 such codes and said that a supplementary list of about 250 codes would be submitted. The effect of the recommendation would be to reduce the number of codes to approximately 180.

Among the codes of direct or indirect automotive nature which Mr. Richberg recommended be abandoned were the anti-friction bearing, commercial vehicle body, die casting, drop forging, gasoline pump, motor fire apparatus manufacturing, motorcycle manufacturing, trailer manufacturing, air transport and commercial aviation. Previously he had advised that the motor vehicle storage and parking code be dropped.

Generalizing his recommendation, Mr. Richberg said:

"1. Withdraw the Federal Government from all compulsory action with reference to service trades. Require the administration to furnish the best protection to labor and competitors in these codes that can practically be furnished on a voluntary basis so far as the Federal Government is concerned.

"2. Require the administration to consolidate all small codes (a) with the appropriate larger codes (thereby eliminating annoyances of overlapping and separate efforts to administer), and (b) with a limited 'small industries' code—effective as to any small industry only when the true representatives of that industry subscribe."

Amelia Earhart to Test Direction Finders for US

Amelia Earhart has been engaged as an aeronautical expert at \$1 a year by the Bureau of Air Commerce, Department of Commerce, according to Rex Martin, acting director of Air Commerce. The first project to be undertaken by Miss Earhart is the service testing of a radio direction finder built by a commercial company to specifications drawn up by the Bureau of Air Commerce.

GM Sales Continue Gains in February

	Feb., 1935	Jan., 1935	Feb., 1934	Two Mos., 1935	Two Mos., 1935
Sales to dealers here and abroad...	121,146	98,268	100,848	219,414	163,354
Sales to U. S. dealers	92,907	75,727	82,222	168,634	128,412
Sales to U. S. consumers	77,297	54,105	58,911	131,402	82,349
Increase in U. S. dealer stocks....	15,610	21,622	23,311	37,232	46,063
Sales to dealers abroad	28,239	22,541	18,626	50,780	34,942



The men behind Dodge Bros. guns. A. VanDerZee, general sales manager, K. T. Keller, Dodge president, and W. J. O'Neil, newly appointed general manager photographed in Mr. Keller's office immediately after announcement of Mr. O'Neil's promotion.

U. S. Got 94% of 1934 Argentine Motor Imports

Automotive imports into the Argentine increased approximately 89 per cent during 1934 over the previous year, according to a report to the Department of Commerce from W. C. Trimble, vice consul at Buenos Aires. The report shows that 18,546 motor vehicles entered the South American country last year and of this total 94.5 per cent were of American origin.

Reo Enfranchises 6 New Distributors, 58 Dealers

During the last two weeks of January and the month of February six new distributors and 58 dealers have been franchised to sell and service Reo passenger cars and

commercial vehicles, according to C. A. Triphagen, general sales manager of the Reo Motor Car Company.

Canadian Jan. Sales Top 1934 in Volume and Value

January retail sales of new passenger cars, trucks and buses in Canada increased 62.2 per cent in total units and 65.6 per cent in dollar value over the same month of 1934. New vehicles numbered 3,456 with a total value of \$3,505,028 in January against 2,131 valued at \$2,116,095 in the corresponding month of last year.

New passenger cars totaled 2,850 with a retail value of \$2,863,880 for the first month of this year which compares with 1,875 units valued at \$1,815,612 for the same month

last year. Again this year Ford led the parade, though this company's unit volume was slightly less than that of the comparable period of 1934. Chevrolet is in second place with an advance of approximately 100 cars over the same period of 1934. Third, fourth and fifth places went to Plymouth, Dodge and Terraplane, respectively, while Buick, Hudson, Studebaker, Oldsmobile, Pontiac, Chrysler and DeSoto followed in the order named. In practically all instances these makes made gains over their totals for the first month of last year.

Oil, Gas Power Meeting at Tulsa, May 8 to 11

The eighth national Oil and Gas Power Meeting under the auspices of the American Society of Mechanical Engineers will be held at Hotel Mayo, Tulsa, Okla., May 8 to 11. A series of technical sessions will be held and in addition there will be an exhibit of oil-engine parts, materials and accessories.

Lindamood to Direct Safetylight Sales

The appointment of Ray W. Lindamood as first vice-president in charge of sales has been announced by The Unity Manufacturing Company of Chicago. The announcement is coincident with the inauguration of a comprehensive national advertising campaign on Safetylight. Mr. Lindamood was for several years sales manager for the Lorraine organization.

Engineers to Aid Boys in Choosing a Career

The Engineers' Council for Professional Development has launched a program designed to provide opportunity for boys in secondary schools who are interested in engineering to make direct personal contact with individual members of the engineering profession who can give the students sympathetic advice in the matter of the choice of a career.

Grade Crossing Item in Revised Relief Bill

An \$800,000,000 item for roads, highways, streets and grade crossing eliminations is provided for in the Glass amendment to the revised Roosevelt \$4,800,000,000 work relief bill which was sent back to the Senate floor this week with a "rush order" for adoption attached.

Hannon Visiting Eisemann European Representatives

J. M. Hannon, sales representative for Eisemann Magneto Corp., is making an extended trip through Italy, France, Tunis, Algeria, and other points to contact Eisemann representatives and to establish service stations. Mr. Hannon will return in about four months.

Johnson Motor Co.

The Johnson Motor Co. reports a net profit for 1934 of \$44,079 against a net loss of \$41,174 in 1933.

New Prices on Studebaker Dictators

Reductions in Studebaker delivered prices ranging up to \$60 have been effected by decreasing the spread between list and delivered figures, and by lower prices on the Dictator models. A comparison of the new and old Dictator prices follows:

	Independent New	Susp. Old	Conventional New	Axle Old
2-p. coupe	\$720	\$720	\$695	\$695
Regal 2-p. coupe	760	760	725	730
4-p. coupe	780	780	745	755
Regal 4-p. coupe	810	810	775	785
Roadster	780	780	745	755
Regal roadster	810	810	775	785
St. Regis sedan	750	750	715	725
St. Regis cust. sedan	775	785	740	760
Regal St. Regis sedan	790	800	755	775
Sedan	780	780	745	755
Cust. sedan	805	815	770	790
Regal sedan	820	830	785	805
Land cruiser	915	915	880	890
Regal land cruiser	930	930	895	905

Safety glass is now \$7.50 extra on the coupes, \$10 on the roadsters and sedans, and \$15 on the land cruisers.

Second Quarter Steel Ordering Under Way

Some Mills Revamping Facilities to Attract More Motor Business

Automotive demand, especially for flat steels, is well maintained. A fair amount of business has been booked by finishing mills for second quarter delivery. Most of this consists of orders for automobile sheets, for the finishing of which buyers want to give mills as much time as they can and be certain that the material will be ready when needed.

The start of operations in one of the Youngstown district plants of a new 75-in. continuous wide hot-strip mill, which later is to be supplemented with a cold-rolling unit, comes as a forcible reminder to the steel industry that from now on productive capacity will be sharply on the uptrend, similar units being scheduled for early operation in other districts. While some of the hopelessly obsolete plants are no longer operating, presumably being destined for the scrap-heap, a good deal of the capacity in operation consists of mechanisms that have been so greatly improved upon in the last few years, as to make for a wide spread between production costs on such mills and those of the latest continuous type. Only the future can tell what the effect of this on prices will be.

The immediate outlook is for a continuance of the market's present price structure for some time to come. While the latest report on shipments by the leading interest denotes a fair gain, 583,137 tons last month, as compared with 385,500 tons in February of 1934, and 534,055 tons in January of this year, shipments twice as heavy have been recorded in good steel years. The leading interests' program for the immediate future aims at so revamping its production facilities and set-up as to come in for a share of the automotive business more nearly in keeping with its traditional share in the country's steel takings as a whole, in more normal years somewhere between 40 and 50 per cent of the whole. Rolling and finishing mills are operating this week at an unchanged rate, with the American Iron and Steel Institute reporting a drop from 48.2 to 47.1 per cent in employed ingot capacity.

Pig Iron—Third quarter prices are due for falling on May 21. Until then the only change in the market can be in the form of price reductions which, however, are not looked for. Granting of higher freight rates by the I.C.C. might force third-quarter advances. Until then, however, automotive foundries are content to continue their present policy of not anticipating their requirements more than their melts make necessary.

Aluminum—Quotations on several grades of secondary aluminum have been fractionally lowered. Prices for virgin metal remain unchanged. Output of virgin metal in the United States last year declined to 75,000,000 pounds compared with 85,000,000 pounds in the preceding year.

Copper—Conferences between foreign and American producers, with a view to improving the metal's position in the world's markets, got under way this week. The home market is marking time with "Blue Eagle" metal continuing to be quoted at 9 cents.

Tin—Quiet and easy. Spot Straits tin was quoted at 46.95 cents at the beginning of the week.

Lead—Unchanged.

Zinc—Quiet and unchanged.

Dealers to Spend J-M Advertising Money

Johns-Manville has announced that its 1935 appropriation for consumer advertising of brake lining will be turned over to the dealer to spend in local advertising. The company has mapped out campaigns for four media, foremost of which is a newspaper campaign illustrated by Don Herold to build up a reputation for the dealer as an expert, scientifically equipped to service brakes. A new kind of brake lining demonstrator, the "Scientific Brake Lining Selector" cabinet, is another feature of the plan.

For every dollar the dealer spends on advertising, Johns-Manville will put up a dollar, J-M's amount not to exceed 5 per cent of its materials bought by the dealer. Besides the newspaper campaign, there are a series of spot radio announcements; a direct mail campaign and a wide variety of signs.

Crossley "Syncrotube" Eliminates Rectifier

The 1935 Crossley Roamio automobile radios, just announced by the Crossley Radio Corp. of Cincinnati, Ohio, are featured by a "syncrotube" which does away with the use of a separate rectifier tube or motor generator and eliminates the need for B batteries. Model 4A1, a four-tube set, has two double-purpose tubes which, when combined with the "syncrotube," are said to give it performance equal to that of a seven-tube set with rectifier.

Joe Adams Visiting West Coast Jobbers

Joe Adams, Toledo Steel Products Co. sales manager, is making a six weeks' business trip visiting jobbers at Los Angeles, San Francisco, Portland, Seattle, Spokane, Boise, Pocatello, Salt Lake City and Denver.

Demand U. S. Withdraw Fuel Taxes by June

A demand that the federal government abandon its taxation on motor fuel and leave that field to the separate states was embodied in a resolution adopted at the recent Washington session of the second Interstate Assembly, the National Highway Users Conference reports. The assembly was comprised of governors and representatives of state legislatures.

The resolution stated: "Resolved, that it is the sense of the Second Interstate Assembly that the federal government retire not later than June 30, 1935, from the field of motor fuel taxation and leave that field to the states and their localities."

Knee Action Story Told By GM in New Pamphlet

A new booklet, entitled "The Story of Knee Action" and "prepared for people who want more information than is usually available in advertising literature," has been published by the Customer Research Staff of General Motors. Copies are being mailed to several hundred thousand motorists who answered GM questionnaires during the past year as well as to others.

Cleverly written and illustrated, the booklet sets up 10 requirements for the front suspension, and then takes all the common types of springing, pointing out their faults and winding up with the two independent suspensions used on the corporation's cars which are said to meet all the requirements equally well. The balance of the booklet is devoted to questions and answers on knee action.

Butcher & Hart to Make Washers, Wire Products

The Butcher & Hart Co. of Toledo has been organized to manufacture lock washers and spring wire products. The principals of the new company are Harold Butcher and Ed. W. Hart.

Formerly Mr. Butcher was vice-president of the Champion Spark Plug Co. and vice-president and sales director of the E. G. Budd Mfg. Co. and the Budd Wheel Co. Mr. Hart was vice-president and factory manager of the Reliance Mfg. Co. until it was acquired by the Eaton Mfg. Co.

CALENDAR OF COMING EVENTS

SHOWS

- Mankato, Minn., Automobile Show Mar. 16-23
Machine Tool Exposition—Cleveland Sept. 10-21

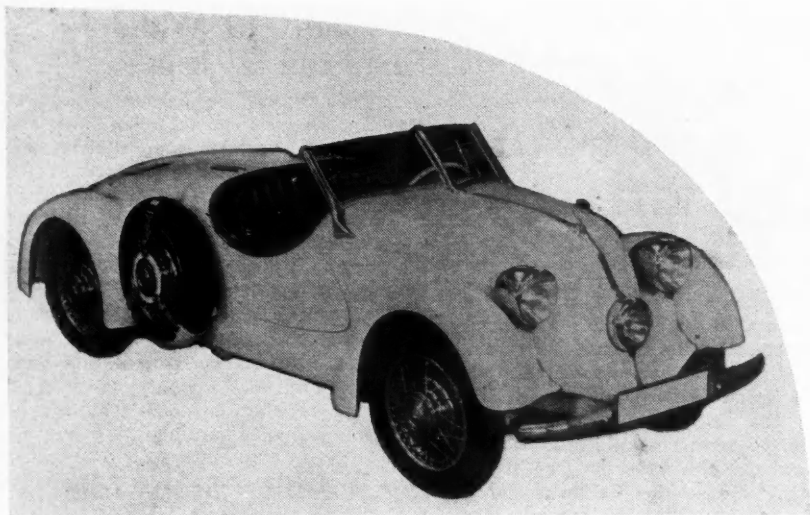
CONVENTIONS AND MEETINGS

- Lafayette, Ind. (Purdue University), Automotive Service Conference, Mar. 21-22
American Gas Association, New York, April 13-14
American Chemical Society, New York, April 22-26

- U. S. Chamber of Commerce Annual Meeting, Washington, D. C.

Apr. 29-May 2

- American Society of Mechanical Engineers (National Oil and Gas Power Meeting), Tulsa, Okla., May 8-11
National Battery Manufacturers Assoc. Spring Convention, Cleveland, May 22-23
S.A.E. Summer Meeting—White Sulphur Springs, Va., June 16-20
American Society for Testing Metals, Detroit, June 24-28
National Safety Council, Louisville, Ky., October 14-18



Mercedes-Benz 91-cu. in. sport roadster

Sports Jobs

Berlin

by Edwin P. A. Heinze

Berlin Correspondent of
Automotive Industries

FROM the passenger-car exhibits at the Berlin automobile show it would appear that the revolution in frame design and suspension systems which has marked the last three years, had been followed by a period of evolution during which makers are concentrating on the improvement of details. But already a new revolution is heralded—directed at an increase in the specific output of engines. Hitherto German designers have been satisfied with a specific output of 20 b.h.p. per liter (one horse power for every 3 cu. in.) displacement, and speeds of 3000-3500 r.p.m., L-head engines being used. With the coming of the Hitler Government there has come a revival of interest in all sports, and especially in the motoring sport. As a result, a demand has arisen for so-called sports models, which are essentially open two-seaters with racy looking bodies, but mostly with conventional engines. However, Adler fits such cars with specially tuned engines, while Mercedes-Benz has developed a sports model with a special "high-efficiency" engine.

What will probably prove the best seller in the German market during the coming season is the new Opel 80 cu. in. Olympia. This supersedes another car of similar displacement which was rather heavy for the small four-cylinder engine rated at 24 hp., and in the new design the weight has been reduced by several hundred pounds. The frame is built integral with the body, which latter is of what is known in Germany as the cabrio-limousine type. Its fabric top can be

rolled back while the sides remain standing. It has two doors and the sides extend forward, the usual trough between front fender and hood being filled in and the headlights built into the body. This car is being offered with full equipment at 2500 marks (\$1000), which is an unprecedentedly low price. Front springing is by the Dubonnet system. The wheelbase is 91 in., while the track is 43.7 in. in front and 46 in. in the rear.

No other new models of note have been introduced in the baby-car class. Next in popularity to the Opel are two models of two-cylinder, two-stroke DKW cars, which are surprisingly speedy considering that their engines have displacements of only 37 and 43 cu. in. respectively. The larger of the two now has the same rear suspension on high transverse springs which was introduced for the four-cylinder model last year. The spring is mounted on a level with the center of gravity of

the car and its ends connect to the steering heads by links.

Much attention is being given to two-stroke engines in Germany and considerable progress is being made. It will be remembered that DKW two years ago came out with a new scavenging system invented by Dr.-Ing. Schnuerle of Stuttgart, which permitted of the use of flat-top pistons. This was followed by a similar system developed by the Zuendapp Company, and this year the Imperia Company has developed both a new scavenging system and a new high-performance engine. Both Zuendapp and Imperia up to this year confined themselves to motorcycles (except for a small four-wheeled delivery truck in the case of Zuendapp). Imperia has now introduced two small cars, a single-seater racing car and a two-seater closed car. Both are well streamlined and are offered at the—for Germany—low price of 3450 marks each.



Hansa Lloyd four-cylinder 67-cu. in. limousine

Featured at Show



New Low-Priced Opel Olympia
model

Frames and suspension subject of detail improvement—Designers seek increases in the specific out- put of powerplants

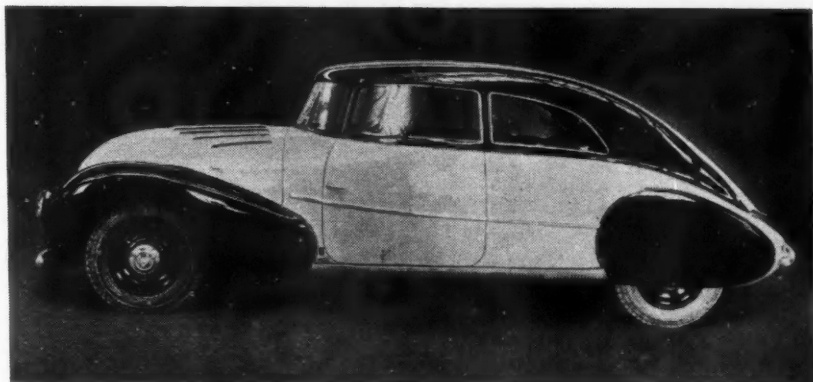
From these midgets to the Maybach is a long step. The latter was the sensation at this year's show. It has a straight, rectangular frame of box-section members, the two side rails at the rear forming a deep banjo through which the driving axles extend. The banjo portions of the side rails are connected by a tubular member of very large diameter. A transverse leaf spring is secured to a spring seat formed on the tubular cross member centrally on top, on a level with the center of gravity. Flanged to the tubular cross member is a four-speed gearbox, the front end of which is supported by a light cross member. The differential housing is inside the tubular cross member and the axle hous-

ings are pivoted to the differential housing to enable them to oscillate vertically. The axle tubes support the ends of the cross spring through the intermediary of coiled springs, and this combination of plate and coiled springs is said to afford excellent riding qualities.

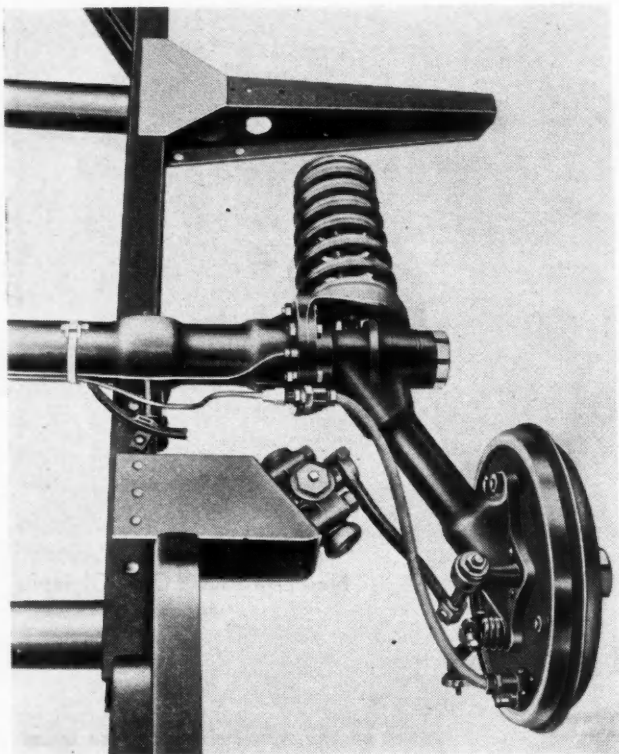
This car is fitted with a six-cylinder engine of 3.54 in. bore and stroke each, which is remarkable for its high output for an engine without supercharger—140 hp. at 4500 r.p.m. Since the displacement is 215 cu. in. this gives a specific output of one horse power for slightly over 1.5 cu. in. Valves are inclined in the head and operated by an overhead camshaft through rockers. The camshaft is driven through helical

gears at the flywheel end, there being only a single intermediate gear, of non-metallic material. A rather novel feature is the use of plate-type valve springs which, by reason of their interleaf friction, prevent surge, and are said to permit operation at speeds far beyond 4500 r.p.m. The engine is mounted on rubber and its power is transmitted to the gearbox at the rear by an exposed shaft. The four-speed gearbox is of the constant-mesh type and gear shifting is effected by means of a small lever on the steering wheel, the peculiar type of jaw-clutch first introduced by Maybach in an overdrive some years ago being employed. With some body types offered, speeds as high as 110 m.p.h. are said to be attainable. Among other models, a very luxurious car with streamlined body built under Jaray patents was shown on the stand.

Another new car was the Mercedes-Benz two-seater sports model, which has a backbone-type of frame forked at the rear end for the mounting of the powerplant consisting of a four-cylinder, overhead-camshaft engine combined with a four-speed transmission and worm final drive. The front wheels are supported by two superposed transverse springs and individually steered by a rack-and-pinion gear, while the rear wheels are arranged and sprung in the now orthodox Mercedes manner with coiled springs. The four-cylinder engine has a bore of 2.83 and a stroke of 3.62 in., making its displacement 91.5 cu. in. Its valves are operated by



Maybach streamlined four-
seater of 140 hp. (Jaray
patents)



Rear independent suspension of Stoeber front-drive car

a chain-driven overhead camshaft. The engine develops 45 hp. at 4000 r.p.m. The gearbox has four forward speeds, including an overdrive.

As this is an open car, considerable difficulty was encountered at first finding a suitable location for the radiator, but the problem was finally solved by placing a small and very deep (8 in.) core over the rear axle behind the engine. A chain-driven blower draws air from the engine compartment and blows it through a header and funnel against the core, the header tank for which is arranged on the right side of the engine over the carburetor. The latter also is supplied with air from the blower, through a separate pipe, and is therefore slightly supercharged. The neat-looking two-seater body—to which the chassis is limited because of the engine location—has the fuel tank in front and a compartment for luggage behind it. Two spare wheels are strapped to the sides of the body directly in front of the rear fenders.

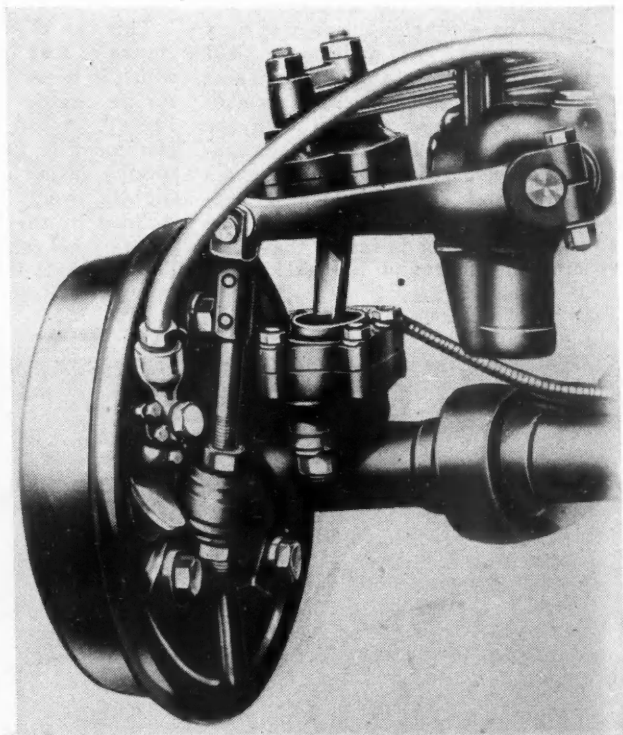
In the Audi front-drive car, which has a backbone-type frame, a new rear suspension has been adopted. The stub axles are supported on triangular members pivoted to the frame, suspension being by a transverse plate spring. Horch cars now are also provided with independent front suspension, at least the V-eight model with the floating engine mounting. A combination of transverse spring and pivoted guides has been adopted, the spring being located below the guide members, which latter are hinged to the electrically-welded, box-section frame. This car now carries a larger engine (215 cu. in.) and the new rear suspension. While the principle embodied in this

suspension is now new, it has not been used for many years. The differential housing is rubber-mounted on the frame, and universally-jointed drive shafts transmit the power from it to the wheels, which latter are carried on a light tubular axle connected to the chassis by conventional semi-elliptic springs. (This is evidently what is known as the De Dion axle—Editor.)

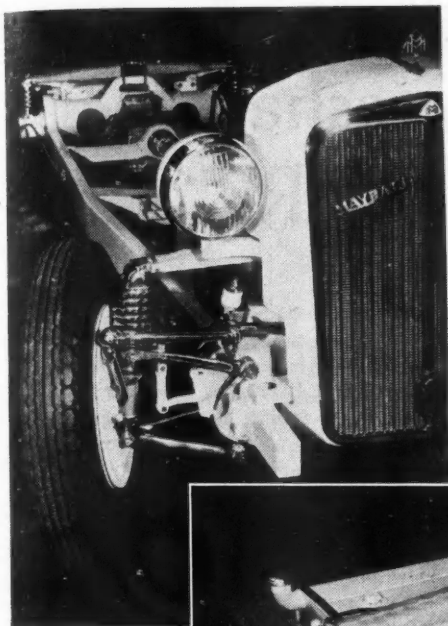
An advantage is that, compared with the conventional axle, the unsprung weight is materially reduced. The same front and rear suspension systems have been adopted also for a straight eight sports cabriolet with a 305 cu. in. engine, but in this case, owing to the great weight of the engine, two transverse springs are used in front, one behind the other.

Four-speed gearboxes are widely used, and synchronizing devices are generally provided. An unusual transmission has been adopted by the Mercedes-Benz Company. This consists of a three-speed transmission combined with an overgear of the Maybach type which can be engaged without unclutching. To assure quietness of the shift from second to third and vice versa, the synchronizing clutch on the sliding member has been transferred to the rear of the gearcase. A relatively large cone is provided, which needs to be slid only 0.08 in., and the shipper fork of this cone is so connected to the sliding mechanism of the transmission (which has a range of motion of 0.32 in.) that a considerable mechanical advantage is obtained, hence the synchronizing mechanism is very quick-acting.

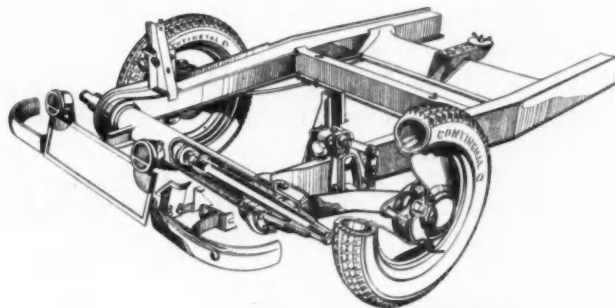
Details of the new rear suspension of the Adler 61-cu. in. front-drive car are now available. The rear wheels are carried by cranks adapted to turn on trunnions formed by the projecting ends of a tubular cross member at the end of the frame, which latter is integral with the body. Suspension is by torsion bars inside the tubular cross member, the bars being anchored to the cross member by means of splines at their inner ends, and they are also



Hansa-Lloyd rear independent suspension

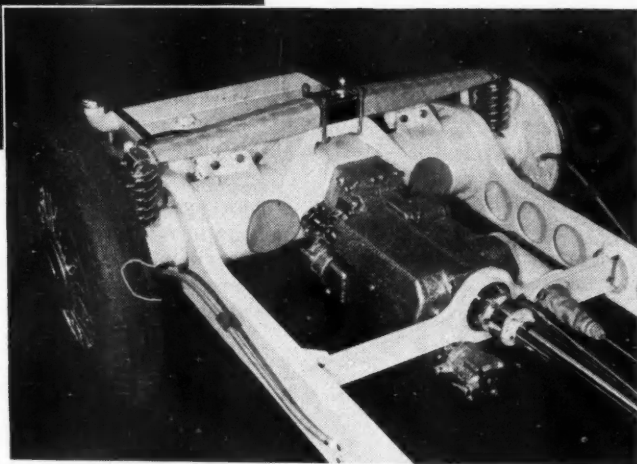


(On left) — Front independent suspension on Maybach



Rear independent torsion-bar suspension of front-drive Adler Trumpf

(Below) — Rear independent suspension on Maybach



connected to the cranked axle ends by splined joints.

A change has been made in the rear suspension of the Stoewer 91-cu. in. front-drive model, the suspension developed for the 150-cu. in. car last year having been adopted. The wheels are carried on cranks, trunnion-mounted on the ends of a tubular cross member. Each wheel-supporting crank is provided with a short drop lever with hinged bolts at the lower end, fitted inside a horizontal coil spring. These springs rest on a perpendicular bracket mounted on the ends of the tubular cross member. Upward movements of the wheels compress the springs, which are exposed. Adjustment of the springs can be readily made by means of nuts on the ends of the hinged bolts. While it was originally claimed that this system of suspension did not require them, shock absorbers are now supplied on both models. Hydraulic shock absorbers are almost universally used in Germany, most of them of the double-acting type. Spring covers are also provided on a number of German cars this year.

Hansa Lloyd has discontinued the small car with 30-cu. in., two-stroke, air-cooled engine at the rear, and now produces only the two models introduced last year, one with a four-cylinder 61-cu. in., 28 hp. engine, the other with a six-cylinder, 94-cu. in., 40 hp.

engine. A backbone frame of box-section is employed, with the engine mounted on a fork at the forward end. The propeller shaft passes through the backbone to the differential housing at the rear end of same, whence the power is transmitted through jointed shafts to the driving wheels. These are no longer suspended on coiled springs like last year, but on a transverse plate spring mounted on top of the differential housing and connected through links with ball-and-socket joints to the ends of the axle tubes. Radius rods extend from the axle tubes to a cross member of the frame.

Bayerische Motorenwerke (B.M.W.) have added a model with a six-cylinder 122-cu. in. valve-in-head engine. The compression ratio is 5.6 to 1, which is relatively low as compared with current German practice. With two carburetors this engine develops 45 hp. at 3750 r.p.m., but when mounted in the sports chassis the compression ratio is increased, three carburetors are fitted, and the output is raised to 55 hp. It is interesting to note that B.M.W. adheres to a frame with tubular side rails and cross members.

Very few foreign manufacturers were represented at the Berlin show. The German Ford Motor Co. introduced the American Ford V-8 car, which is later to be built in the Cologne Ford Works. The company is increas-

ing its capitalization from 2 to 17 million marks in order to raise funds necessary to enlarge the Cologne plant for the production of this model. The Citroen company, which also has a plant at Cologne, exhibited its two front-drive models. Renault and Austin exhibited their current models and the Austro-Daimler-Steyr Company of Berlin showed the Steyr line, including a new 122-cu. in. model developed from the former 91-cu. in. car. The Czechoslovakian industry was represented by the Tatra and Praga. A license for the manufacture of the 91-cu. in. four-cylinder and the 183-cu. in. eight-cylinder Tatra cars in Germany has been acquired by the Stoewer company. The smaller of these was produced in Germany last year by the New Roehr Co., which was compelled to cease operations a few months ago, as was the N. A. G. firm shortly after last year's automobile show. It may be recalled that both Tatra models are fitted with air-cooled engines, the smaller having a four-cylinder opposed horizontal engine in front and the larger one a V-eight engine at the rear of the streamlined car which was the sensation of last year's Berlin show.

During 1934 the German industry produced no fewer than 160,000 cars, which exceeds by 45,000 the best previous record, established in 1928, when the German industry proper produced 115,000 cars and assembly plants for foreign cars assembled 35,000. Small cars dominate the market, and of all new cars registered last year, 92.7 per cent had engines of less than 125-cu. in. displacement. In 1934 the largest business in point of numbers of cars sold was done by the Adam Opel Company, German subsidiary of General Motors Co., whose proportion of the total sales was 40.1 per cent. Next came the Auto-Union combine (four makes) which accounted for 21.9 per cent.

New Amidships Driveshaft Bearing Developed by MRC

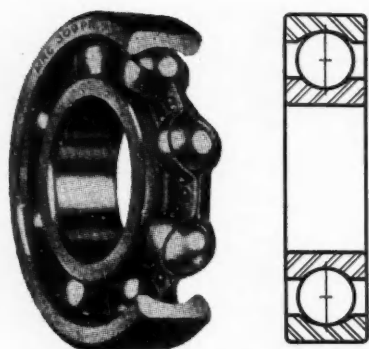


Fig. 1—Section of MRC Type PR Bearing

A SPECIAL bearing for use on long trucks and buses with two-part propeller shaft has been developed by the Marlin-Rockwell Corporation, Jamestown, N. Y. An investigation of the loads to which this "amidships" bearing may be subjected on occasion indicated that there was need for a more rugged type of bearing than the medium or 300 series formerly generally used at this point—a bearing that does not have the flat outer race characteristic of the full self-aligning type. The special bearing developed for this location is claimed to retain most of the ruggedness of the deep-groove type, and, because of its inherent shock capacity, it is possible to use a smaller, more economical design of hanger or mounting.

The propeller shaft bearing is always placed forward of the universal joint connecting the two sections of the shaft, in order to make the rear section as long as possible and thus reduce the angularity of the joint. Investigation showed that the bearing has to take care of very little tilt due to frame deflection. The maximum deflection due to this cause is estimated to be $\frac{1}{4}$ deg., so that any single-row type of ball bearing will do.

Much greater deflections occur as a result of errors in setting up the housing in the first place, especially if insufficient care is exercised in placing the cross member in the frame and in jig-drilling the holes for engine mounting. A check of a number of regular-production trucks in which such errors existed showed the maximum deflection to be $\frac{1}{2}$ in. per foot.

The special MRC propeller shaft bearing is of standard type modified to be able to withstand 3 deg. of total angularity of $1\frac{1}{2}$ deg. each way.

More than half of all propeller-shaft bearing failures are said to be due to foreign matter working its way into

Spring-loaded unit seals of the leather or composition type have become practically universal for propeller-shaft bearings. The flexibility of the garter-spring type is particularly advantageous where the alignment is poor. Furthermore, the unit type can be pressed directly into the bore of the housing, eliminating the need for a cap, bolts and some expensive machine work.

The seals should be mounted with the tips outward, as their major function is to exclude dirt. A little grease leakage at this point does no harm, as there is always enough left for the bearing. If the seal is turned inward for assembly or other reasons, it is important to provide a small relief hole near the grease fitting to take care of over-greasing, to prevent excessive heating that would otherwise result.

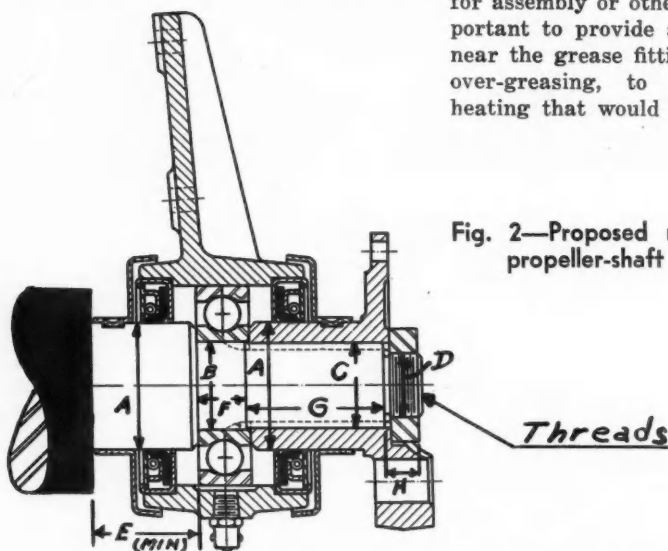


Fig. 2—Proposed mounting for propeller-shaft bearing

the bearing. Very few seals perform their function properly if the housing is not square with the shaft. Experience has shown that if a felt seal is used, the felt ring should be quite large and flexible, and the caps should be fairly loose and bolted down only after the housing is in place, so they can center themselves on the shaft in accordance with the tilt of the housing.

Simple pressed steel external fingers are valuable, as they ward off most of the mud splashed onto the housing. Fig. 2 shows a design for a propeller shaft bearing hanger that embodies these various features, viz., the new light series MRC propeller-shaft ball bearing, unit-type spring-loaded seals pressed directly into the housing, and external fingers. In addition, a splined, straight-bore universal-joint hub replaces the former standard taper bore, thereby eliminating a locknut, a lock-washer and a spacing sleeve. A new standard for propeller-shaft ends comprising this drawing and the accompanying table is being proposed to the S.A.E. Standards Committee by Thomas Barish, assistant chief engineer of Marlin-Rockwell Corporation.

Table of Standards Submitted to SAE

Bearing Number	A	B +.0000 -.0005	C	D Thread	E	F	G	H	Spline
207-PR* 307-PR	1.938	1.3780	1.374	1" x 20 AN	2 3/4	21/32	1 29/32	3/4	10-A
208-PR* 308-PR	1.938	1.5748	1.499	1" x 20 AN	2 3/4	11/16	1 15/16	3/4	10-A
209-PR 309-PR*	2.250	1.7717	1.750	1" x 20	3"	23/32	1 31/32	7/8	10-A
210-PR 310-PR	2.500	1.9685	1.938	1 1/4 x 18	3"	3/4	2 7/16	1"	10-A

*Dimensions from large production models.

JUST AMONG OURSELVES

The Small Truck Operator

"It is likely that regulation of the kind proposed," Federal Coordinator of Transportation Eastman said in his recent report on transportation legislation, "will somewhat lessen the flexibility of truck operations and set up requirements which small or poorly financed operators will not be able to meet." Congressional committee hearings on his regulatory bill indicate there are some members of our national legislative body who are not so confident as the Coordinator that the losses in flexibility and the elimination of the small operator will be offset by the benefits of the type of regulation he proposes. There are some, too, who don't agree that the rules of the game should be written to foster the common carrier at the expense of the contract operator, as Mr. Eastman advises.

Incidentally, "informed observers," as the newspaper gossip columns describe them, tell us that this session of Congress isn't likely to pass any drastic legislation unless President Roosevelt applies pressure. The most that is expected is some mild form of control and even that isn't too certain.

* * *

Cigaret Lighters For Car Prospects

ANY dealer will agree that owners are the best source of prospects, and Archie Andrews' new scheme for selling Hupps appears to be designed to

capitalize on this condition. Letters are to go to the more than 200,000 Hupp owners in the United States, it is reported, asking them to send in the names of four prospective Hupp buyers and receive in return a flameless cigarette lighter. The names so obtained will go to the Hupp sales organization. For each sale resulting, the owner responsible for the tip gets \$20 in \$5 weekly instalments from the Hupp factory. Neither the dealer nor retail salesman pay any part of this commission. Later, it is indicated, the plan will be broadened to include other than Hupp owners.

Naturally there is considerable skepticism as to the potentialities of the plan, as there always is when a departure from previous practice is proposed. As the plan gets under way, Hupp registrations will provide the answer.

* * *

No Industry-Wide Bargaining

AS expected by everybody including the A. F. of L., the AMA has refused to arrange a conference between its members and representatives of the federation. In fact, when Mr. Green requested a conference, his proposal seemed so obviously stage setting intended to put the federation in a position to wash its hands of responsibility in the event of strife by claiming that it had exhausted every means to attain a pacific settlement, that any other action on the part of the manufacturers was unthinkable.

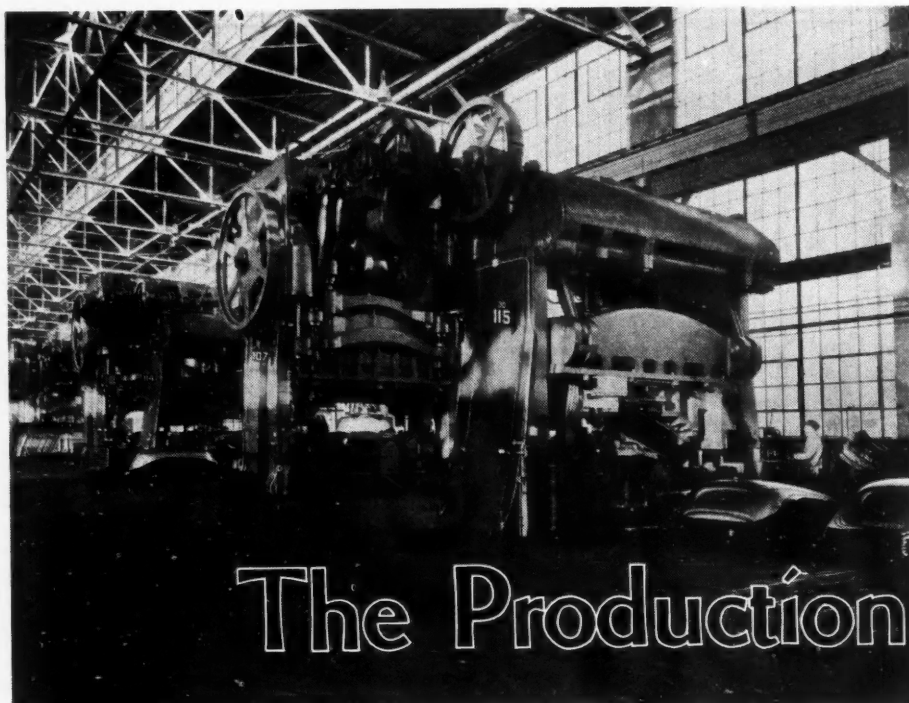
Neither Mr. Green nor the federation can authenticate the claim that either is entitled to speak for automobile workers generally, as the AMA letter points out. Moreover, the letter makes it clear that each manufacturer will deal with the representatives of his employees, but that they will not bargain as a group. This is in accordance with the law which puts employers under no compulsion to bargain on an industry-wide basis. In other words, employees may bargain individually or collectively as they see fit, and so may employers.

* * *

German Engineers Must Join Technical Societies

UNDER the new political regime in Germany, corporations of all kinds have been reorganized. Every engineer and technician in the future is to belong to a professional society of the Reichsgemeinschaft der Technisch - Wissenschaftlichen Arbeit (Federal Association of Scientific-Technical Work). In case the work of any particular engineer makes it desirable for him to belong to more than one professional society, he needs to pay only nominal dues to any additional technical societies he may wish to join, so-called administration charges (\$2.40). Subscriptions to the periodicals of these other societies are not included, but are available at reduced rates. Engineers and technicians in the motor vehicle industry are to secure membership in the Automobile and Aero-Technical Society (A.T.G.). Members of this society who are members of the National-Socialist party automatically become members of the National-Socialist Union of German Engineering without extra dues.

The Editors



The Production of Turret

by Joseph Geschelin
Engineering Editor,
Automotive Industries

Fig. 1—Battery of four giant presses installed to draw and form the Fisher "turret top"

THE turret top, the seamless steel roof construction which the Fisher Body Division of General Motors is providing for the 1935 Pontiac, Oldsmobile and Chevrolet Master de luxe models, represents one of the outstanding achievements in the art of automobile body building.

As pointed out in *Automotive Industries* last month, the "turret top" stampings alone required the installation of 18 giant presses, some of them being the largest in the automotive industry. But that's only a part of the story. What interested us particularly was the complete transformation of certain of the Fisher Body plants to facilitate the building of 1935 bodies, with higher quality standards and yet at costs consistent with what the public can afford to pay.

Through the courtesy of the management of the Pontiac Fisher Body plant, we were able to view the manufacture of the 1935 line of Pontiac bodies and are presenting some of this activity, chiefly pictorial, to the readers of *Automotive Industries*.

To visualize the picture more clearly, let us note that the entire line of Pontiac bodies, six distinct models—business coupe, 2-door sedan, 4-door sedan, sport coupe, 2-door touring sedan, 4-door touring sedan, and cabriolet—is built completely within the confines of this plant. Body stampings and doors, body assembly, metal finish, trimming, and painting, all are done here and the finished bodies are delivered directly to the final chassis line through a covered passageway connecting the end of

the body line with the body drop at the Pontiac car factory.

Bodies are supplied for the Pontiac deLuxe 8, deLuxe 6, and the standard 6. Not the least of the scheduling prob-

lems in the body plant are concerned with color options alone, the combinations of body and color for the three lines being respectively 28, 28, and 15.

The new bodies consist of five main



Fig. 2—One of the new toggle presses forming the windshield opening and door pillars on the front section stamping which is now integral with the instrument panel

units—the “turret top,” two sides, the steel front end, and steel underbody—welded together to form a complete steel outer paneling. Following the customary procedure, the body sheets are first blanked and then go through the stretcher leveling machine which renders the sheet ductile and free of the tendency to produce stretcher strains, worms or tears in subsequent stamping operations.

Fig. 1 is a view of the battery of four huge presses used to draw and

form the “turret top” stamping which extends from the windshield header around the back to include the rear window opening, and down to form the flange for the luggage compartment opening.

Among the most interesting features of the new presses installed by Fisher Body, aside from their size and great capacity, is the fact that frequent die changes to accommodate various types of stampings can be made most readily and economically. On the new “four-

point” presses, all adjustments for different die heights are contained in the bed which is elevated or lowered by an electric motor with push-button control. The slide is non-adjustable.

The fact that the bed is always at the right working height from the floor provides better working conditions for the press operators. Ring bolsters, slide plates, and other fillers are no longer needed. The pneumatic cushions are so arranged as to travel up and down with the bed, thus maintaining a fixed location relative to the bolster plate. This eliminates the need for bolster stools and pressure pins of various lengths.

Another feature of the new presses, aimed particularly at safeguarding the press operators, is the use of duplicate sets of control buttons, two “start” and one “stop” buttons

being provided for each operator. The press can't be started until every operator, be there two or four, places both hands on the start-buttons, and they must keep their hands on the buttons until the die has closed. The press stops automatically at the top stroke, after completing the cycle.

In Fig. 2 we see another of the new heavy-duty presses forming the windshield opening and corner posts in the front section stamping, which now incorporates the instrument panel. It might be well to mention in this connection that all formed corners at the

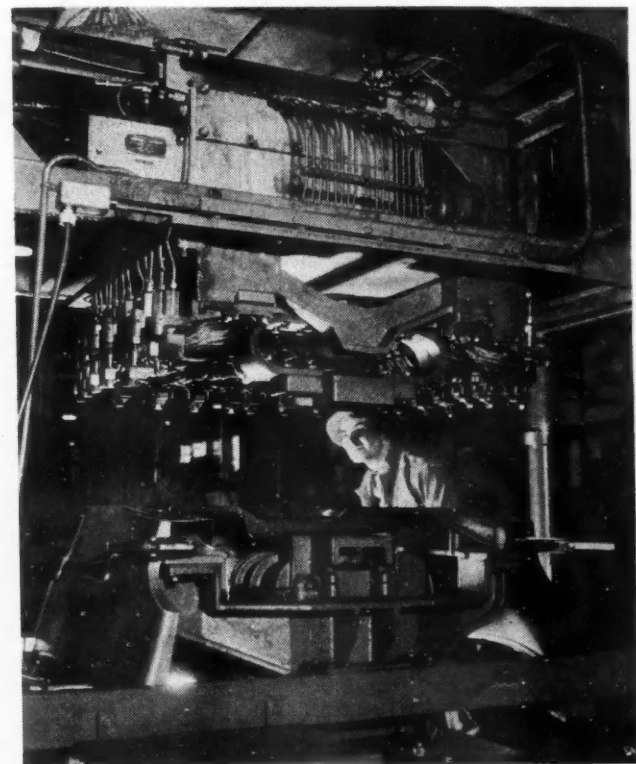
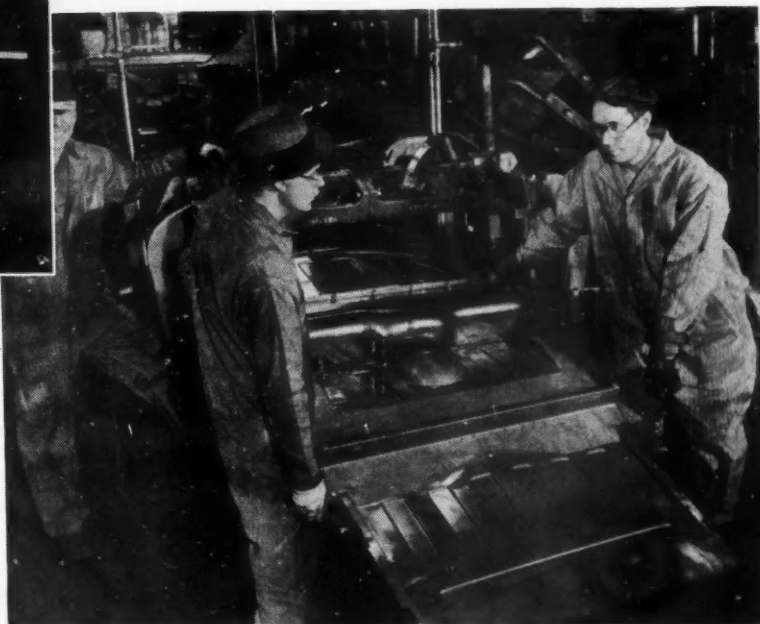


Fig. 3—50 spot welds are produced automatically with this hydraulic gun welder, timed to hit one spot at a time in sequence. Here the dash is welded to the cowl side panels.

Fig. 4—This welding buck is used for joining the two sections of the steel underbody. Various fittings also are gas-welded in place



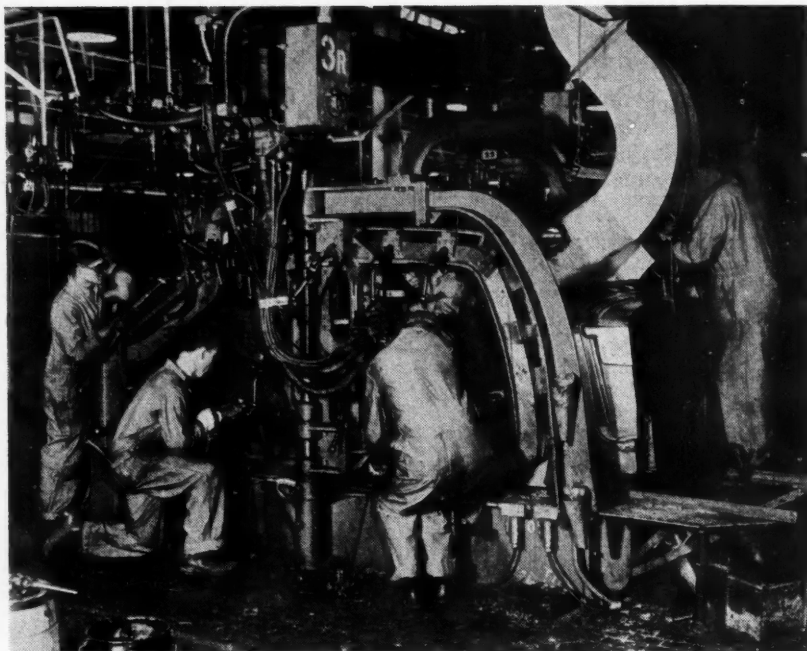


Fig. 5—Set-up buck, one of a battery, in which the five main sections are aligned and welded together. Note the suction collector duct used to carry off fumes.

window openings in panels and doors are annealed with oxy-acetylene torches, to eliminate the concentrated strains at these points.

Passing from the press department, whose operations are rather familiar to most readers of *Automotive Industries*, we come next to the great variety of welding stations equipped with many new types of welding machines designed specifically for the assembly of these bodies. Running the gamut of welding technique, these stations feature spot welding, bar welding, hydraulic spot welding, and many gas welding steps. It is interesting to find that on all heavy duty welding operations the tools are water-cooled to increase their life and reduce down time for maintenance.

One of the interesting welding machines is the hydraulic spot welder shown in Fig. 3. Here the dash is welded to the cowl side panels, 50 spots being made automatically. In this machine, the spot welding heads clamp the work hydraulically, assuring accurate alignment, and one spot is made at a time, the contacts being timed by an automatic timing device which may be seen at the top. By virtue of this cycle, the transformer capacity of the machine is very small and, despite the fact that 50 spots are made, the energy

required at any point in the cycle amounts to the current draw of only one welding gun.

Another of the major units, the underbody, is shown in Fig. 4. This is a view of a special welding buck in which the two sections of the underbody are spot welded into one piece and the various fittings gas welded in place.

After the front end assembly has been completely welded into a unit, the five major units of the body are assembled in the set-up buck shown in Fig. 5, one of a battery, each one being de-

signed to handle a specific body type. In this massive fixture, the body parts are accurately aligned, and with the door framing held to size, the outer shell is welded into an integral unit. The welding operations include spot welding and gas welding at various points with perhaps five or six men at work during the operation. Due to the great volume of fumes generated during the course of the job, the machine is fitted with a suction collector duct at the right, which effectively removes the undesirable atmosphere. This is another detail that shows how far the organization is going to make working conditions safer and more pleasant.

Upon leaving this station, the shell passes down another line where the panel insulating material is applied and the interior bracing installed. Then the unit comes to the master welding buck, one of a battery of four, shown in Fig. 6. Before the body leaves this machine it is completely finished as to major welding operations, including the reinforcement of the wheel housings, facing of doors, windshield header and cowl joints, front pillars, and the joining of the bracing framework to the shell.

This machine is a notable example of the modern bar welder, using water-cooled tools, with which the various

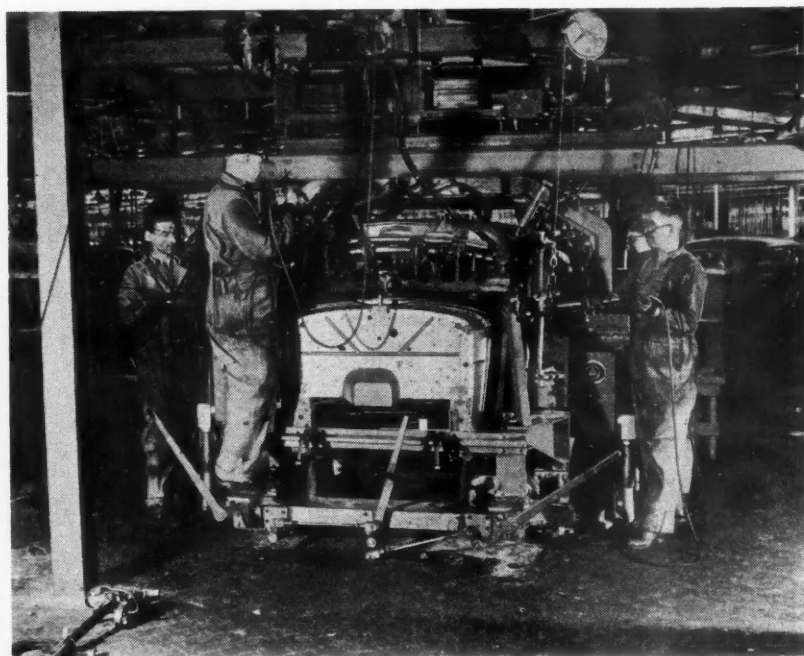


Fig. 6—Master welding buck, one of a battery of four machines, completing the welding of the entire structure. It is an excellent example of a modern bar welder, using water-cooled tools.

spot welds are completed with great rapidity. The transformer rigging for the machine is seen overhead. The massive fixture elements are suspended overhead from the reels and after swinging into place are locked rigidly by means of mechanism operated by the levers which are seen in the foreground.

A portion of the metal finishing line may be seen in Fig. 7. This takes in the customary operations of repair welding, hanging and fitting of doors, soldering the gas welds at the junction of the "turret top" and side panels, etc. Portions of the overhead monorail carrying the door assemblies in sets, may be seen in the background, encircling this department.

The trim department, naturally, is one of the major activities in this plant. When production is in full swing, some 8000 yds. of 54-in. mohair of excellent quality and 5000 yds. of sheeting, not to mention the leather for sport jobs, are cut and fabricated daily.

The component parts of seat cushions and seat backs are assembled in sets and proceed to the seat cushion conveyor, of typical design, which may be seen in Fig. 8. At the right, in this battery of three machines, are the entering ends of the fixtures showing the rails that depress the cushion springs into their normal position, thus permitting the operators to tack down the upholstery while the units move down the conveyor line.

After being prepared for finishing, the body proceeds to the paint shop, then the glass department, and finally to the trim line shown in Fig. 9. Here are applied the headlining, door trim, arm rests, and weatherstripping, followed by fitting the jute floor lining and the mounting of seats and backs. The windshield assembly and garnish moldings also are applied along the line. One of the interesting features of this line is the use of high-frequency portable tools which roll along on the live tramrail overhead, permitting the operator to move with the body without change of position.

Finally the bodies are given a general cleaning and polishing in preparation for the final inspection. And when they have passed muster under the watchful eyes of the men whose job it is to find fault, the bodies travel down the covered ramp to meet the chassis line in the Pontiac assembly plant.



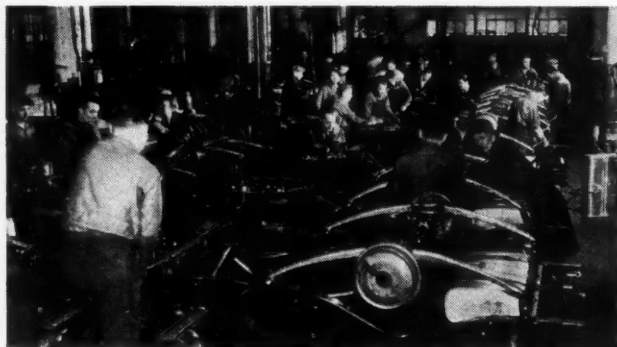
Fig. 7—Metal finishing line at the Pontiac Fisher body plant



Fig. 8—View at the entering end of the seat cushion assembly conveyor. At the right are the ends of the depressor rails of the three machines



Fig. 9—Final trim line at the Pontiac Fisher body plant



Production Lines of the Industry: Start of the Pontiac chassis line. Man in the foreground is attaching the grappling hooks which flop the chassis right side up and send it down the line

PRODUCTION LINES

Synthetics

A wealth of development is going on in the field of synthetic auto-body finishes. One of the things in the offing is a lacquer compounded with synthetic resin which won't require sanding, thus cutting finishing costs materially. Incidentally, those handsome wheels on Olds and Pontiac are finished with a synthetic enamel that looks like a porcelain. You will recall that Plymouth tried synthetic enamel finish a few seasons back, but had to abandon it. Well, we hear that they're taking another crack at it, what with recent improvements in the material. We believe that every two-door job is being finished in synthetic enamel this season.

Power Changes

A new deal in high-voltage power transmission—constant-current D C—is envisioned by the work of General Electric scientists as described in a paper before the A.I.E.E. by Drs. Willis, Bedford and Elder. This system comprises conversion of constant-potential A C power to constant-current D C power, transmission of constant-current D C power, and reconversion to constant-potential A C power. The promising features of this system are its unusual stability and reliability; for example, the high-voltage constant-current D C line may be short-circuited without damage to line or equipment.

One Definition

Oiliness is the ability of the true lubricant contained in the oil to cling to the surface to be lubricated,

and depends on three factors: first, structure of the fields of force surrounding the molecule of the "true" lubricant; second, structure of the fields of force surrounding all of the other constituents of the true lubricant and its carrier; and, third, structure of the fields of force emanating from the surfaces to be lubricated.—From Parish and Cammen Bulletin No. 2.

Enduro

Republic has just issued a new booklet—No. 125-A—describing the applications of Enduro 18-8 material. It includes informative data on fabrication and some new material on physical properties. Ask us for a copy.

Social Security

A succinct but comprehensive outline of all the provisions and implications of pending federal social security legislation will be found in a special bulletin issued by the National Assn. of Manufacturers. Ask for N.A.M. Labor Relations Bull., No. 5, Vol. 1. It tells the whole story without editorial comment—and it's the best presentation we have seen.

Hard Plating

Under the surface—as we are permitted to see it—there is much activity by way of utilizing the unique properties of chromium plate for various mechanical applications. Not to confuse this with decorative plating—we mean applications such as the plating of twist drills, reamers, files, taps, dies, gages, etc. More recently, the technique gained in this

development has led to an extension of uses. Thus, quite a few people are experimenting with the chromium plating of large engine cylinder bores, cylinder liners, etc. Many have saved time and trouble by plating water and oil pump shafts, as well as hard-worked thrust bearings. Racing outboards are taking a new lease on life with chrome-plated cylinders. While such applications are endless, their success depends largely upon a knowledge of the plating art and the ability to plate the gamut of engineering materials. Go to the expert if you will have the right results.

Aircraft Valve

Just a few comments on a very unique aircraft engine valve development. To begin with, the valve is made entirely of a special austenitic steel forged with a hollow head, cooled with sodium. By a special technique of puddling Stellite both the valve tip and, wherever necessary, the valve seat surface are hard-faced. The stem is a problem. It is made hard by nitriding—something quite new—to a depth of about 0.002 in. Chromium plating also has been tried and may be worth some further experimentation.

About Materials

With the increasing emphasis upon lower costs and lower delivered prices on new cars, something should be done to make the public conscious of the new materials that make these developments possible. How else is the public to understand why the smaller package, lighter in weight but packing a bigger punch, can take it and carry on? It is something well worth considering. J. G.

MANUFACTURING
MANAGEMENT
METALLURGY

Studebaker in Strengthened Position as Reorganization Move Is Completed



Paul G. Hoffman who has been elected president of the reorganized Studebaker company

by Don Blanchard
Editor, Automotive Industries

pany has no liabilities other than to its common stockholders, whose equity is carried on the books at \$18,933,104, or \$8.85 per share.

In addition to the reduction in costs resulting from the decrease in the funded debt, operating economies will accrue from the huge write-down of the plant and equipment account. On the last balance sheet of the old company this account showed \$49,828,873, as contrasted with \$15,592,695 on the new balance sheet. Obviously a slash of

EIGHTY - THREE - YEAR - OLD Studebaker completed the reorganization of its tangled financial affairs last week with the election of Paul Hoffman and Harold Vance to the presidency and board chairmanship respectively. Under the leadership of these two men, who, with A. G. Bean, directed the affairs of the company as receivers and trustees, the revamped corporation has emerged from two years of trials and tribulations ready for the vigorous competition that lies ahead.

The *pro forma* balance sheet of the new company presents a picture of financial strength. Working capital totals \$9,183,940, including \$7,178,435 in cash, and the current ratio is 2.67 to 1. Current assets are practically 50 per cent of the corporation's total resources. On the liability side, there are no bank loans and funded debt has been cut nearly 55 per cent from \$15,126,072 to \$6,869,380 in the form of ten-year 6 per cent convertible debentures. As a result of this reduction in funded debt, annual interest charges have been pared from over \$900,000 to about \$412,000. Moreover, in 1935, 1936 and 1937 the company is obligated to pay only 3 per cent interest on the debentures at the discretion of the directors, the other 3 per cent accruing until maturity if the directors do not want to pay it sooner. Aside from current obligations and the debentures, the com-

Balance Sheets

	Old Company Dec. 31, 1934	New Company Dec. 31, 1934 (Pro Forma)
Assets		
Cash	\$ 2,038,508	\$ 7,178,435
Sight Drafts	1,273,620	1,273,620
Receivables (Net)	561,736	561,736
Inventories (Net)	6,009,805	6,009,005
White Stock (at cost)	26,853,822	.....
Plant & Equipment (Net)	49,828,873	15,592,695
Other Assets	1,156,017	1,025,849
Total Assets	\$87,722,371	\$31,642,140
Liabilities		
Current Liabilities	\$ 5,821,093	\$ 5,839,656
Debentures .....	.....	6,869,380
Claims of Studebaker & Rockne—		
6% Gold Notes	15,126,072	.....
Bank Loans	3,632,085	.....
Miscellaneous	1,611,952	.....
Rockne	821,776	.....
Total Liabilities	\$21,191,885	\$12,709,036
Preferred Stock	5,808,200	.....
Common Stock	49,285,740	2,136,705
Surplus	5,615,453	16,796,399
Total Liabilities	\$87,722,371	\$31,642,140
Current Assets	9,883,669	15,023,596
Current Liabilities	5,821,093	5,839,656
Working Capital	\$ 4,062,576	\$ 9,183,940

these proportions means important savings in depreciation charges, etc.

This summary of what the balance sheet reveals concerning the position of the new company, however, tells only part of the story. There are a number of other important tangible and intangible assets. First, and most vital of these, is the Studebaker name. Despite the gossiping competition that a receivership brings, from the date the receivers were appointed in 1933 to the end of 1934, approximately 100,000 units were sold here and abroad and net sales amounted to roughly \$70,000,000. In the kind of market that has existed in the last two years, this is an impressive record in the face of a receivership. Furthermore, there are over 600,000 owners of Studebaker cars in the United States, and the new company starts out with approximately 2000 retail outlets through which to distribute its products to the domestic market. Then there are the men who will manage the new company. Paul Hoffman and Harold Vance already have been mentioned. In addition there are D. G. "Barney" Roos, vice-president in charge of engineering; George Keller, vice-president in charge of sales; Ralph Vail, vice-president in charge of manufacturing; C. K. Whittaker, vice-president in charge of New York operations; A. G. Rumpf, secretary and treasurer, and H. E. Dalton, comptroller.

Messrs. Hoffman and Vance are under contract to the new company until Feb. 28, 1938, and in addition to their salaries have been given options to purchase 30,000 shares each of the new common at \$5 per share, or at the average closing price on the N. Y. Stock Exchange in the 30 days following the consummation of the reorganization plan, whichever is higher. These options run to Aug. 31, 1938. This agreement has additional features which need not be detailed here. These options, moreover, are a part of a broad program established by the reorganization plan under which there shall be reserved for sale or use as compensation to such of the principal executives and employees of the corporation and under such conditions as the board of directors may determine, up to 150,000 shares of the new common. This program provides that between now and Feb. 28, 1938, the directors may allot up to 40,000 shares of the new common to principal executives and employees excepting Messrs. Hoffman and Vance.

The fundamentals of the reorganization plan whereby the claims against the old company were satisfied and the new company was provided with working capital, are simple. Studebaker and Rockne creditors got all the White Motor stock, a substantial block of new Studebaker common, and some cash and debentures. Holders of the old preferred stock got new common, and debenture and new common subscription rights. Holders of the old common got debentures and new common subscription rights. Creditors also got subscription rights under certain con-

ditions, which will be explained subsequently, and any subscription rights not exercised were taken up by the underwriters.

Claims against the old Studebaker company amounted to \$20,381,977, including the more than \$15,000,000 of notes issued in connection with the purchase in 1932 of 95.11 per cent of the common stock of the White company. These claims were discharged as follows: For each \$100 of claims, four

shares of the new Studebaker \$1 par common and 2.64 shares of White common were paid. This arrangement gave these claimants 587,969 White shares and 890,862 shares of new Studebaker common, in addition to certain impounded cash. The White common is quoted currently at about \$10 per share, but has a book value of about \$38. As previously stated, the book value of the new Studebaker common is \$8.55.

Rockne claims amount to \$819,088.

WHAT CREDITORS, STOCKHOLDERS, ETC. OF OLD COMPANY GOT

	Claims*	Cash	White Common No. of Shares	Stude- baker Corp. of Dela- ware (New Company) 6%, 10- yr. De- bentures	Stude- baker Corp. of Dela- ware (New Com- pany) Common Stock— No. of Shares
Creditors					
Rockne: For each \$100 in claims, \$25 in cash, \$50 in debentures, 0.7 share of White and 1 share of new common	\$819,088	\$226,752	6,349	\$453,504	9,070
Studebaker: For each \$100 in claims, 2.64 shares of White and 4 shares of new common	\$20,381,977	.....	587,969	.....	890,862
Old Company \$100 Preferred: 58,082 outstanding, 1 1/4 shares of new common .....	.....	.....	.....	.....	72,603
					213,670
Underwriters					
Subscription Rights					
Old Preferred: On payment of \$15 per share get \$15 in debentures and 2 2/9 shares of new common .....	.....	.....	.....	\$871,230	129,071
Old Common: On payment of \$2.25 per share get \$2.25 in debentures and 1/3 shares of new common. 2,464,287 shares of old common outstanding .....	.....	.....	.....	\$5,544,646	821,429
Debentures and new common earmarked for subscription by holders of old preferred and common, but not purchased by them, may be bought by creditors on same terms offered to holders of old common. Any balance after creditors have bought what they want goes to the underwriters.					
Totals	\$21,201,065	\$226,752	594,318	\$6,869,380	2,136,705
Additional debentures .....	.....	.....	.....	\$130,620	.....
Issued .....	.....	.....	.....	\$7,000,000	2,136,705
Listed on N. Y. Stock Exchange .....	.....	.....	.....	\$7,000,000	2,800,000
Authorized .....	.....	.....	.....	\$7,000,000	5,000,000

* Estimated. Actual amounts of allowed claims may exceed estimate which accounts for apparent discrepancies in this table.

These were paid on the basis of \$25 cash, \$50 in debentures and 0.7 share of White for each \$100. This took \$226,752 in cash, \$453,504 in debentures and 6349 shares of White.

Holders of the 58,082 outstanding shares of the \$100 preferred stock of the old company got $1\frac{1}{4}$ shares of the new common per share of the old preferred, or a total of 72,603 shares of the new common. In addition, they are entitled to buy \$15 of debentures and receive a bonus of $2\frac{2}{9}$ shares of the new common for each share of the old preferred.

Holders of the old common got the right to buy \$2.25 of debentures and receive a bonus of $\frac{1}{3}$ share of the new common for each share of the old common.

Any subscription rights remaining after holders of the old common and preferred, who desired to do so, had exercised their rights, could be taken up by Studebaker and Rockne creditors on the basis offered the old common holders, and some creditors exercised these rights extensively. Remaining debentures and new common stock earmarked for subscription under the plan were absorbed by the underwriters. These subscription rights covered \$871,230 of debentures and 129,071 new common for the old preferred and \$5,544,646 of debentures and 821,429 shares of the new common for the old common. Nearly half of the new capital received by the company came from the exercise of subscription rights.

For their services the underwriters got 10 per cent of the new common outstanding on consummation of the plan, which gives them 213,670 shares.

Recapitulating, the old company, including Rockne, had claims against it of \$21,205,065 and had outstanding 58,082 shares of preferred and 2,464,287 shares of common. Under the reorganization plan, these claims and obligations were met by the payment of \$226,752 in cash, the issuance of \$6,869,380



Harold S. Vance, new Studebaker board chairman

in debentures, the transfer of 594,318 shares of White common, and the issuance of 2,136,705 shares of the new common.

The issue of debentures totaled \$7,000,000, all of which have been listed on the N. Y. Stock Exchange. The difference between this figure and the one given in the preceding paragraph is \$130,620, this sum in debentures apparently being earmarked for Rockne creditors if need arises. The Stock Exchange has also listed 2,800,000 shares of the new common (5,000,000 authorized), although the plan does not call for the issuance of 663,295 of these shares. The 150,000 shares required for the management stock plan referred to earlier evidently will come from these unissued shares. Stockholders may also subscribe for pro rata portions of the unissued stock.

The debentures are convertible into common stock at the rate of eight shares of new common for each \$100 of debentures, and 560,000 shares have been reserved for this purpose. They

are also redeemable in whole or in part on 45 days' notice. In the event of default, the debentures may be declared due and payable. After April 1, 1938, 20 per cent of the net earnings of the corporation in the preceding year must be paid into a sinking fund for the retirement of the debentures.

The underwriters of the plan who evidenced their confidence in the future of the independent automobile manufacturer by their participation are Lehman Brothers, Field, Glore & Co., Hayden, Stone & Co., Goldman, Sachs & Co. and associates.

On the board of directors of the new company are A. G. Bean, Paul G. Hoffman, Harold S. Vance, J. F. Cotter, E. W. Strickland, James G. Blaine, Jr., M. T. Moore, Harold Hirsch, Frank E. Joseph, John H. Watson, Jr., E. J. Quintal and Anthony L. Michel.

Automotive Industries is confident that it expresses the sentiment of the industry when it wishes the new company and its management the best of success.

Principles of Motor Fuel Preparation and Application

Vol. I, by Alfred W. Nash and Donald A. Howes. Published by John Wiley & Sons, New York, \$8.00.

This work deals with the principles of the processes employed in motor fuel production rather than with the details of the processes. Of the authors, one is professor of petroleum technology in the University of Birmingham, England, the other a petroleum technologist connected with the Anglo-Persian Oil Company, Ltd.

The work is to appear in two volumes, of which the first—here under review—deals with the production of motor fuels from crude petroleum by methods of distillation, cracking, extraction from natural gas and hydrogenation. Other motor fuels, such as alcohol, benzol and various synthetic

products, are also dealt with at some length. The second volume will cover such subjects as analysis, sulfur content, gumming, volatility requirements, knock ratings, and specifications of fuels for carburetor and Diesel engines.

The treatment is of a nature that appeals to the technologist. Naturally, to make the work comprehensive, a good deal of information is included that is familiar to most men connected with the fuel industry in a technical capacity. This is no ground for criticism, however for the most devoted readers of technical books are usually the younger members of the particular industry, whose background in the technology of their chosen field is still incomplete.

The scope of the volume under review may be gaged by the following

chapter heads: The Principles of Distillation; The Production of Motor Fuels from Petroleum by Distillation; The Production of Motor Fuels from Petroleum by Cracking; The Production of Motor Fuels by the Extraction of Gasoline from Natural Gas; The Refining of Motor Fuels; Storage, Insurance and Distribution; Benzole—Its Production and Use as a Motor Fuel; The Production of Motor Fuels by the Hydrogenation Process as Applied to Mineral Oils and Coals; Alcohol Fuels; Synthetic Fuels and Other Auxiliary Supplies of Motor Spirits.

The book leans toward the scientific, and a knowledge of chemistry and mathematics is required to be able to read it. Each chapter is followed by an extended bibliography of the subject covered in it.

Factors Controlling

Part Three

Preceding instalments appeared in March 2nd and March 9th issues

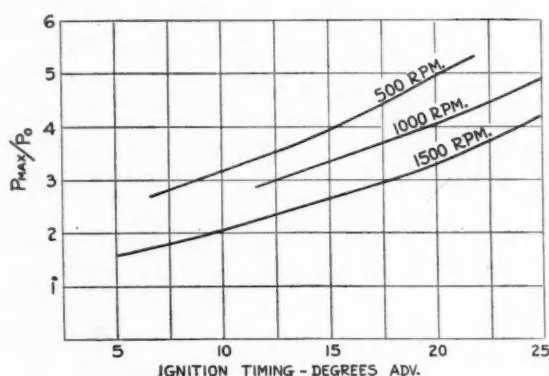
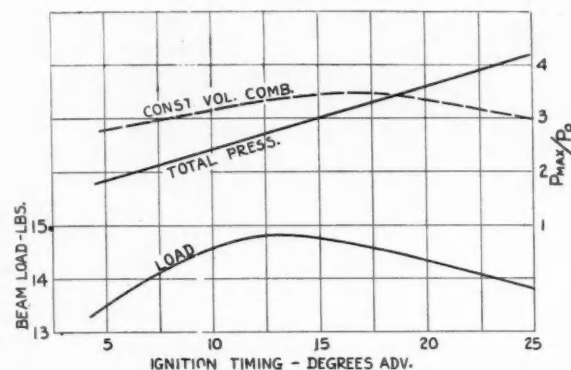


Fig. 21—The ratio of maximum pressure to pressure at ignition varies with speed and ignition timing. If pressures are reduced to constant-volume conditions, the ratio is fairly constant.

combustion velocity and ignition timing have modified the original p-t characteristics. The effect of the variable involved has been discussed already.

If one is satisfied with the basic (const.-vol.) relations, which at least should be indicative of the direction of change in the actual characteristics, it is necessary to choose the constants for the calculations from actual test results reduced to constant-volume conditions. So, for example, the ratio of maximum pressure to pressure at ignition varies a great deal with ignition timing and speed if actual (total) pressures are taken from indicator cards (Fig. 21) but is fairly constant if the pressure values considered are first reduced to const.-vol. conditions. The exponent in the combustion time-pressure relation, so far as our experience shows, cannot be chosen to fit all con-

A NUMBER of investigators have undertaken the difficult task of approaching the combustion process in an internal combustion engine by analytical methods. Most of these methods are based on thermodynamic calculations in which an attempt is made to consider all the variables affecting the phenomenon. In fact, it is impossible to include all the variables in an analytical method, and, therefore, we see that all methods developed for predetermining p-t characteristics from chamber geometry are based upon several assumptions (as a given ratio of maximum pressure to pressure at ignition, combustion velocity an exponential function of developed pressure, the compression of the unburnt gas following a polytropic law, etc.), which are determined from practical test results. The limitations of such methods are at once obvious if we consider the Table in Fig. 1. We see that while the volume distribution, as fixed by design, does determine the basic (const.-vol.) p-t characteristics, the actual p-t relations are obtained only after the combined effect of the actual

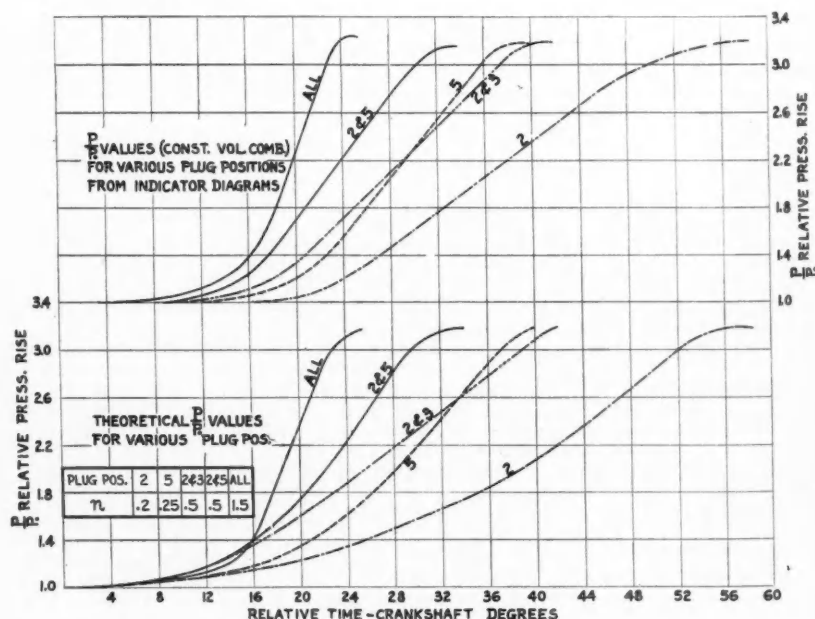


Fig. 22—Comparison of the relative pressure rise from actual indicator curves reduced to constant-volume conditions and theoretical-pressure-rise curves computed by an analytical method.

The exponent "m" in the relation "reaction velocity = $f(p)_m$ " is varied to fit the individual conditions.

Engine Combustion

by Hector Rabezzana
and Stephen Kalmar

ditions, considering the numerous factors affecting the rate of reaction. So, for instance, in an assumed relation for the reaction velocity $= f(p)^m$, "m" has to be varied from 0.2 to 1.5 in order to check with actual diagrams. This is seen in Fig. 22 in which a series of p-t curves are presented, in which the actual relative pressure rise due to const.-vol. combustion is compared to the theoretical relative pressure rise curves computed by the analytical method. The agreement at the start is not very close, due to the pressure lag period in the actual curves, which cannot be very well incorporated in the analytical procedure.

Wide experience, however, extending over a large variation of chamber types, might enable the designer to predict, to a certain extent, final p-t characteristics from geometrical volume distribution only; but the generalization and application of such theoretical methods may lead to doubtful conclusions.

We have adopted the method of ionized gaps to determine fundamental p-t relations and we find that our results are more than justifying the additional work and time necessary to

equip cylinder heads with—say—eight miniature spark-plugs, screwed directly into the chamber roof as shown in Fig. 23. These plugs serve a double purpose; first they can be used to ignite the mixture at various locations (to find the optimum position) and, second, they are used as ionization gaps to take flame travel diagrams. Simultaneously a pressure record is taken, which together with the flame travel diagrams supplies all the necessary data for calculating p-t relations. After having determined the basic p-t relations for the main types of chambers (considering variables such as heat exchange due to wall material, thickness,

valves, speed, timing, etc.) we feel that we are in position to use a theoretical method to predetermine p-t characteristics intelligently and successfully.

Single Cylinder Tests

The apparatus used in this development work consisted of a single-cylinder test engine having a bore of $3\frac{1}{2}$ in. and stroke of 4 in., connected to a 40 h.p. G.E. dynamometer. Besides the usual testing equipment (as fuel measuring device, neon-tube timing indicator, etc.) a carbon-stack telemeter-type engine indicator was used to take indicator cards, records being made by means of a G.E. oscillograph, which was also used to record the flame-travel diagrams. The engine was equipped for multiple ignition. The whole setup is shown in Fig. 24. The combustion chamber, shown in Fig. 3, was of the non-compact, offset type, horizontal roof, with about 25 per cent of the piston area covered; it was equipped to take nine regular metric-size spark plugs, the positions of which were numbered from 1 to 9.

The object of the test was to compare various twin-ignition combinations with the best single-ignition position for power, economy and detonation. The procedure followed was, first, to determine at 1500 r.p.m., full load, the variation of power vs. ignition timing for each of the twin and single locations. From these so-called "spark fish hooks" (Fig. 25) the maximum power was determined for each location. Next, position 5 was selected as the best single-ignition location, and positions 2 and 3, and 2 and 5 as the best locations for twin-ignition. Most of the

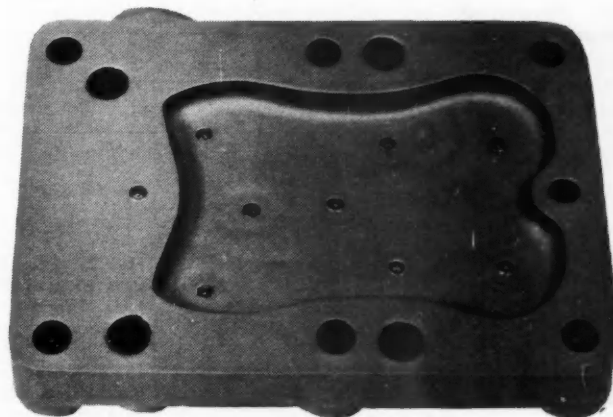


Fig. 23—Cylinder head equipped with miniature spark plugs which serve as ignition plugs and ionized gaps.

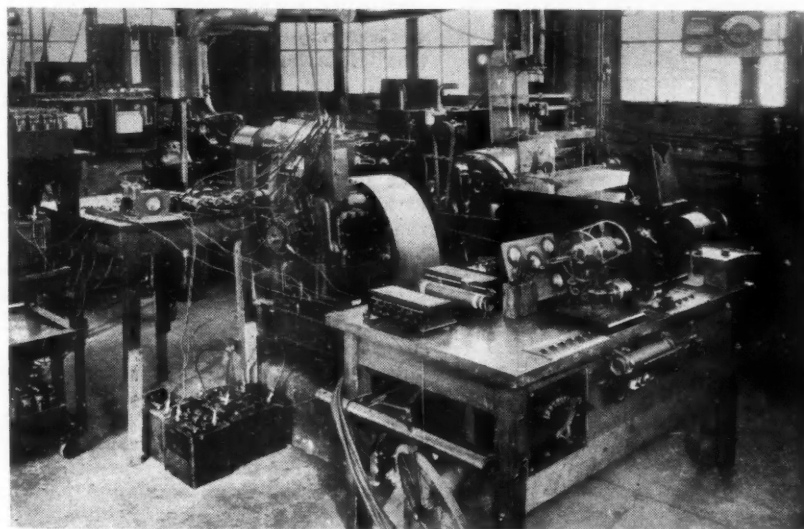


Fig. 24—Single-cylinder engine and test equipment.

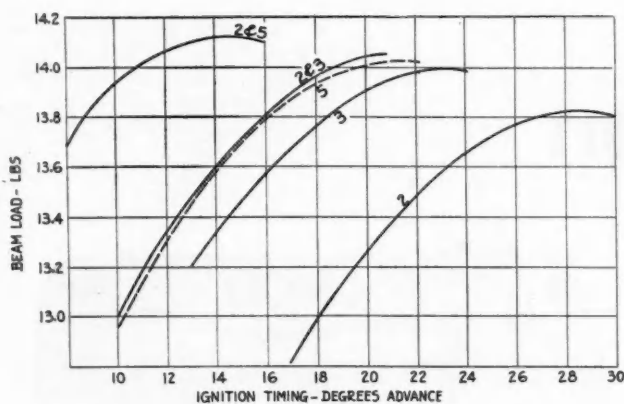


Fig. 25 (Left)—Power vs. spark advance curves from which the best settings for each ignition location were determined.

comparative tests were made with these three firing positions.

The first series of runs was made at a compression ratio of 5:1, the second at 5.45:1 and the third at 5.9:1. Each of the series comprised a power and economy test at 1500 and 2500 r.p.m. and a detonation test at 1500 r.p.m., full load.

The procedure in each run was the following: First, a run was made with all the plug locations, using standard Red Crown gasoline as fuel, with the maximum power settings determined from the "spark fish-hooks," varying the fuel consumption and the results plotted. From these "fuel fish-hooks" the power and specific consumption, both for maximum power and maximum economy, were determined. Next came the detonation test, consisting of a power test with undoped fuel, at leanest for best-power carburetor setting, varying the spark to determine the percent of power loss for borderline detonation. All tests comprising the same group of comparative runs were made on the same day. Power readings were corrected to standard atmospheric conditions (barometer 29.92 in., intake

Fig. 27 (Right)—Results of detonation tests (upper curves) and tests with lean mixture (lower curves). The advantage of double ignition as a means to control detonation is the greater, the higher the compression ratio. The advantage of double ignition where lean mixtures must be fired is evident.

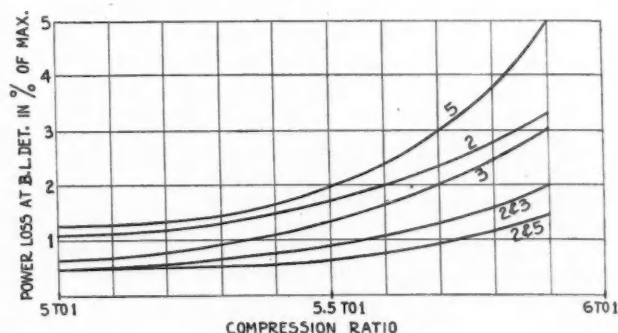
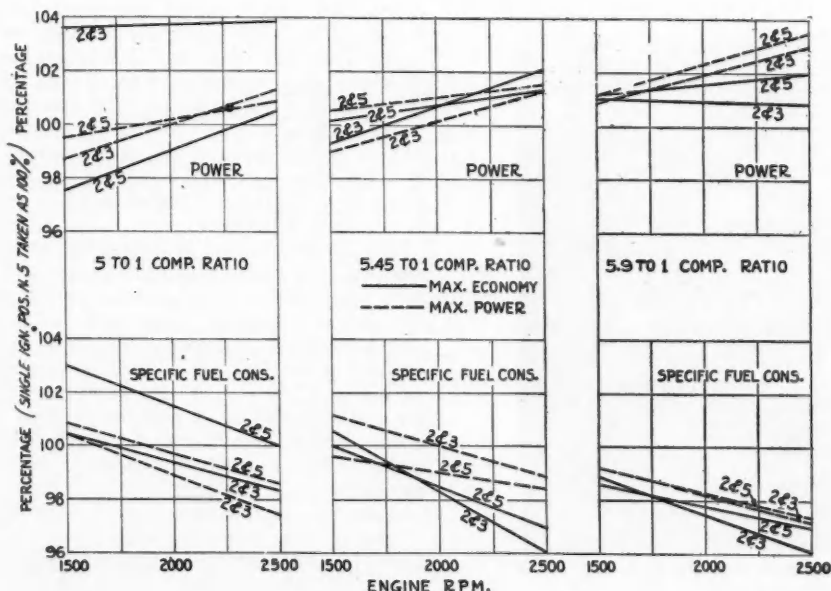
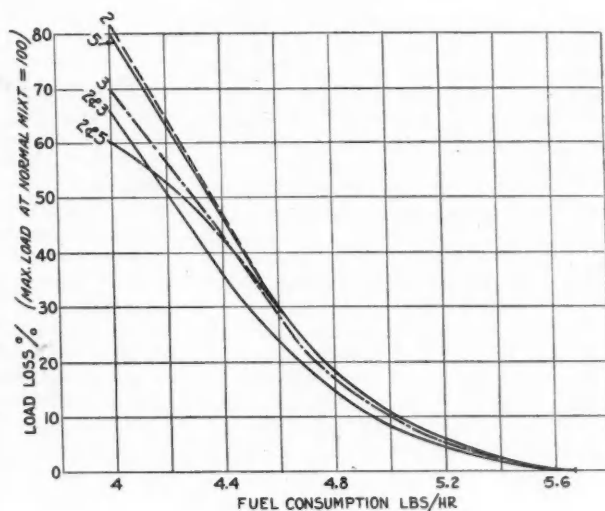


Fig. 26 (Below)—Results of power and economy tests with single and double ignition. The advantage of double ignition increases with increasing compression ratio and speed.



air 103 deg. F., and humidity corresponding to .5 in. Hg. v.p.).

Results of the power and economy test are plotted in Fig. 26 on a percentage basis, the power and economy values with the single position 5 being taken as 100 per cent. The general trend of these curves shows that the advantage of twin-ignition increases with increasing compression ratio and speed. At the lowest compression ratio (5:1) and 1500 r.p.m., there is no gain in power

or economy—if anything there is a small loss. At 2500 r.p.m. there is a small gain. This indicates that at higher speeds combustion is more complete with double-ignition than with single-ignition. At 5.45:1 CRP., there is a small gain at 1500 r.p.m. already; at 2500 r.p.m. the gain is greater. At the highest ratio (5.9:1) also, the advantage at 1500 r.p.m. is small, but that at 2500 r.p.m. is considerable.

These results, however, are only one side of the picture, for they represent comparisons of power and economy only. To make the comparison complete, we have to consider also the detonation characteristics. At the top of Fig. 27 are shown the results of the detonation runs. They represent the percentage loss from maximum power, due to ignition retard for incipient detonation (borderline) which is a comparative measure of anti-detonation

characteristics. At a compression ratio of 5:1 the power losses for positions 5, 2-5 and 2-3 are 1.26 per cent, 0.48 per cent and 0.48 per cent respectively. At a compression ratio of 5.45:1, the losses are 1.8 per cent, 0.64 per cent, and 0.48 per cent, and at the highest ratio (5.9:1) the losses are 5 per cent, 1.48, and 2 per cent. From these curves we can determine the relative gain in compression ratio by changing from single-ignition (pos. 5) to double-ignition (pos. 2-3 or 2-5). The gain is the greater, the higher the compression ratio. In addition, of course, there is some gain in

power with respect to single-ignition.

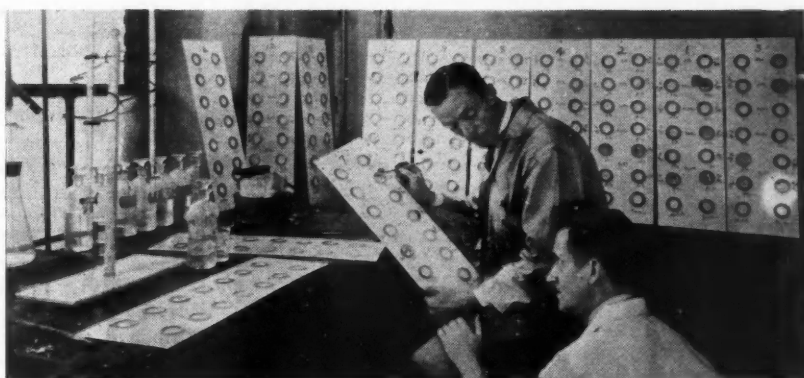
If, instead of position 5 we select position 3, which is somewhat better for detonation, but less efficient for power and economy, the gain represented by using position 2-5 with double-ignition is not as great, but still considerable. In this latter case, however, the gain in power (of position 2-5 over position 3) is considerably greater than it is in the case of position 2-5 vs. position 5.

In all the tests discussed above, when double-ignition was used, both plugs were fired simultaneously. It was also attempted to time the two plugs dif-

ferently; the results, however, indicated that simultaneous firing is the best.

The ability to fire lean mixtures with single- and double-ignition was also compared. The lower curves in Fig. 27 show the results of a series of runs with lean carburetor setting; it is clearly seen that the power loss with respect to maximum power with standard carburetor setting is considerably less, when double-ignition is used; the gain is the more pronounced the leaner the mixture. This can mean only one thing, namely, that the ability to fire and burn lean mixtures is greatly increased by using double-ignition.

New Methods for Testing Chemical Resistance of Paint Coatings



The system for testing paint coatings developed by the Sherwin-Williams laboratories is not only easy and quick but accurate

A SPOT method for testing paint coatings has been developed in the Sherwin-Williams laboratories. This permits the spraying of a uniform coat on a panel. Several reagents can be tested on the surface of each, and recordings may be kept alongside.

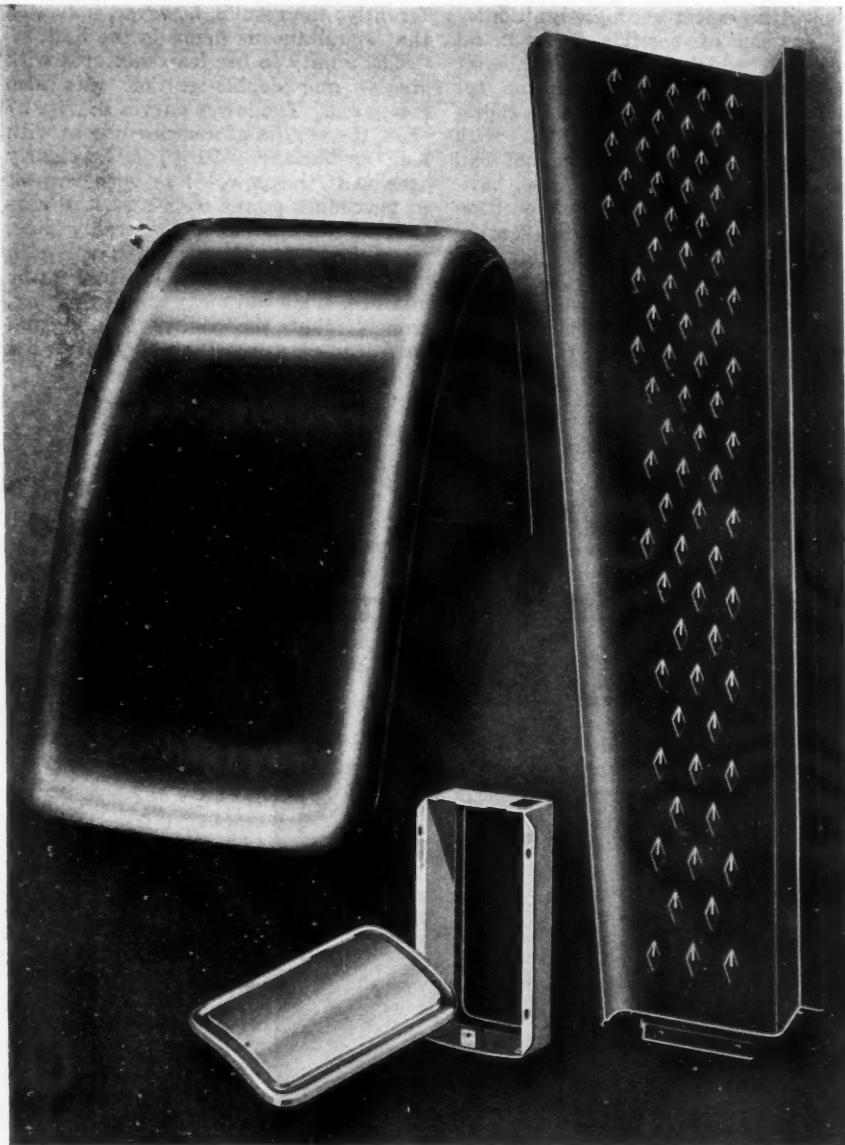
An airtight seal is made as follows: Rubber rings are cut from 1/16 in. inner tube stock. The inside diameter of the rings is 1 1/8 in. and the outside diameter 1 3/4 in. After cutting, the rings are immersed in a melted mixture consisting of 50 parts paraffine, 20 parts carnauba wax and 30 parts Halowax 1013. While the melting point of the mixture is about 200 deg. F., it is advisable to hold the temperature of the melt between 250 deg. and 300 deg. F., to prevent solidification of the wax when rings are immersed.

Centers for the rings are marked off on the panel to be tested. The panel is then placed under a hot water tap reverse side up. This pre-warming prevents chilling of the wax when the dipped rings are placed on the panel. Excess wax should always be drained off the rings before placing them on the panel, after which they should be pressed at several points to insure complete contact. As soon as the wax has cooled to the point where the surface gloss is lost, a 2000 gm. brass weight is applied to mold the top of the wax to a smooth, level surface.

One c.c. of reagent may be poured into each ring by means of a pipette. Three by two in. microscopic slides are generally satisfactory for covers. Since they are made of colorless glass, many observations may be

made without removing them. When inspection of a particular spot is to be made, it is a simple matter to absorb the reagent into a swab of clean cotton to examine the paint surface.

This technique for making chemical resistance tests of a paint film is not only quick and easy, but is also said to be very accurate. The wax mixture indicated is not affected by any water soluble, common acids or alkalis. Concentration can be controlled by means of the seal, and all notations on reagent, film, time and results can be recorded right beside the ring on the panel. These panels may easily be kept for reference or observation at any time. This is a simple, inexpensive and accurate method adaptable as standard laboratory practice in the automobile and allied industries.



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YORK STAMPINGS

March 16, 1935

Binks Thor Model 20 Gun

Because ordinary spray guns are said to clog up when used with heavy materials such as cut back asphalt, sound deadener, insulating and other heavy materials, the Binks Manufacturing Company, Chicago, Ill., has perfected a new straight line heavy material spray gun, the Thor Model 20.



Thor straight line material spray gun

In this gun, a $\frac{3}{4}$ in. material passage is on a straight line with the nozzle, thus eliminating the possibility of clogging. The $\frac{3}{4}$ in. air inlet is seen just above the material inlet. Nozzle sizes vary according to the material to be sprayed. Instead of the conventional trigger, the air and material outlets are opened and closed by a sturdy hand lever especially suited to the conditions under which heavy material is sprayed. The ring at the top makes it easy to hang the gun on a rack when not in use.

Spiral Bevel Pinion Rougher

Gleason Works, Rochester, N. Y., has recently brought out a spiral bevel pinion rougher which is said to be two to three times as fast in production as the older type of machine. It will rough both spiral bevel and hypoid pinions.

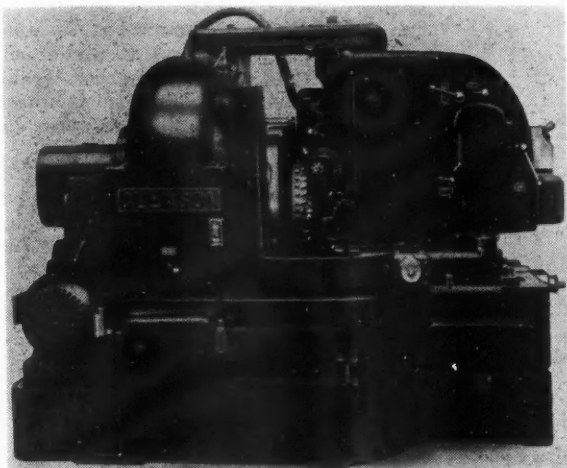
The cutter is mounted in a full circular cradle to permit adjustments through 360 deg. in cutting both spiral bevel and hypoid pinions. The machine comprises a heavy one-piece frame with the cutter cradle mounted at one side and column holding the work-head mounted on the other side and with an overhead tie rigidly securing the cradle and column together.

The work-head which is mounted on a very large and sturdy sliding base swings about an axis other than the center of the machine so that when removing the work from the spindle there is ample clearance between the work

Automotive Industries

NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools



This Gleason spiral bevel gear rougher is said to have a new high production speed

and cutter for convenience in removing and replacing pinions.

The machine is automatically arranged so that as the last tooth is cut the work-head is withdrawn at full speed to the chucking position. A single lever is used to dechuck the work. A power-stripper mechanism is also provided to eject the cut pinion so that it is loosened ready for removal.

After a pinion is placed in the spindle, the chucking lever is manually operated to clamp the work and bring an arm forward, which in turn brings the outboard support arm in engagement with the pinion and also starts the cutter motor.

The operator then starts the automatic cycle of the machine by tripping another lever. This starts the down-roll and index. After the bottom of the roll is reached the blank feeds in rapidly until it engages the cutter, after which the feed rate slows down. The rate of feed and the point at which it trips in are adjustable mechanically and actuated hydraulically.

When the work has been fed to the full depth of the uproll the generation is started. The roll rate is uniform for approximately the first half of the roll. By the time the center of the roll is reached most of the stock has been removed. The roll rate is gradually increased from this point to the end of the roll. When the end of the generating roll is reached the feed cylinder

trips, withdrawing the work a sufficient amount to clear the cutting blades on the down-roll.

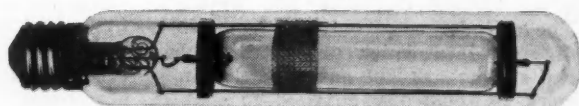
Capacity of the machine—largest cone distance, 30 deg. spiral angle, 7½ in. longest face, 1¼ in. Floor space about 62 x 85 in. Net weight about 15,390.

High Intensity Mercury Vapor Lamp

The General Electric Vapor Lamp Company, Hoboken, N. J., has perfected a High Intensity Mercury Vapor Lamp which is particularly suitable for high bay lighting. It is a new approach to an industrial white light which is restful to the eye, and enables quick visual response even to details unknown under other commercial lighting. It is said to be a particularly efficient lamp in that it produces 14,000 lumens at a consumption of 400 watts or approximately 35 lumens per watt. It is made with a Mogul screw base for vertical mounting. The lamp has an overall length of 13 in. and is designed for operation on 110-volt and 220-volt, 60-cycle circuits. It has an average life of 1500 hr.

From a technical standpoint the High Intensity Light is not white. It is a combination of blue light and yellow-green which produces a whiter sensation to the observer.

More light for less
power claimed for
this GE lamp

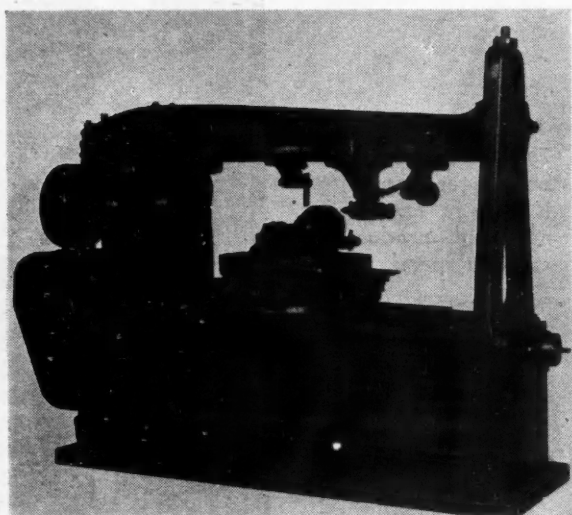


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NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools



Barber-Colman Hobbing Machine

To facilitate the economical hobbing of taper splines, the Barber-Colman Co., Rockford, Ill., has brought out a new hobbing machine, Type T, which not only handles taper splines but also takes care of the usual hobbing operations including the hobbing of worm gears with tangential feed.

In many respects, this machine resembles the regular Barber-Colman Type "A" Hobbing Machine. The hob slide swivel construction is the main point of difference, since a means had to be provided to traverse the hob not only laterally, but also longitudinally. The hob has a tapered form; the longest teeth enter the work first and cut the deepest part of the keys. As the hob moves along the shaft, it also moves across it so that progressively shorter teeth cut shallower portions of the splines until the end is reached. A given hob can make a variety of tapers on a given size of shaft, but for a different size shaft a separate hob will be required.

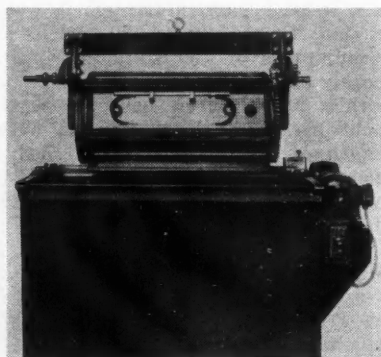
The operating and controlling mechanisms for this machine are somewhat different than the ordinary hobbing machine. There is an additional feed screw in the lower hob swivel slide to give the hob its longitudinal traverse. Special micrometer dials on the work slide and main feed screw aid in positioning these members accurately for loading. All controls are on the front of the machine, handy to the operator.

The machine is powered with a 5-hp. electric motor mounted in the base behind the ventilated cover. Automatic stops and safety stops are provided on the two traversing slides. A quick-action tailstock helps to speed up loading and unloading between cuts.

Floor space required is 60 x 106 in. Net weight is about 8500 lb.

The Udylite Plating Barrel

The Udylite Company, Detroit, Mich., has just developed a plating barrel which is said to be outstanding because



of its strength, durability and efficiency. The cylinder consists of a framework of steel into which are fitted rubber rail and heads. The entire steel framework is anodically charged so that it

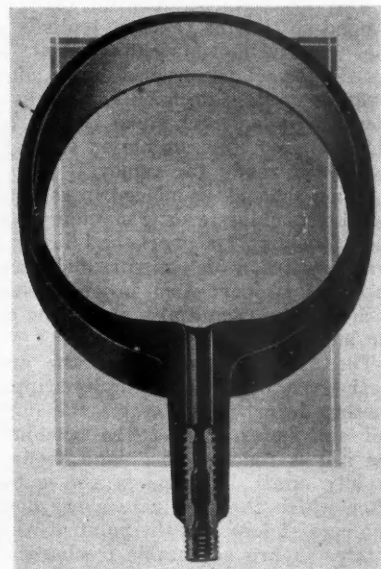
does not plate. The rubber used in the Udylite barrel is a special, shock-resistant rubber, formed, not moulded. Its resistance to shocks and stresses is said to be many times greater than that of ordinary moulded rubber.

Cylinder rotates on self-aligning bearings located at both ends. Insulation of cathode lead is unbroken from bus bar to dangles—treeing is said to be completely prevented. Cathode lead is rod copper encased in three layers of rubber. Anodically charged hanger houses cathode lead and protects it mechanically. All metal parts, submerged in plating solution are anodically charged. Contact arbor shank heavily chromium plated to facilitate cleaning. Three dangles on arbor insure ample supply of current.

Thermo-controlled push button switch, conveniently located, guards motor against overloading or single phasing. Pins fastened to yoke connect cathode bus bar with cathode lead and support cylinder firmly in saddles at four points—two on each side of the tank.

Firestone Sealtype Tube

A new tire tube for which it is claimed that it is both pinch-proof and leak-proof has been developed by the Firestone Tire & Rubber Co., Akron, Ohio. It is made of a tough black rub-



ber compound similar to tire-tread stock, and is formed with a base of extra thickness. Pinching is said to be prevented by the toughness of the stock and the thickness of the tread, which features also enable the tube to resist cutting and wear better, adding to its life. The leak-proof feature is ascribed to a specially-compounded silver lining, which seals the rubber against air loss, and to an all-rubber valve stem vulcanized into the tube as an inseparable unit. This valve construction also adds strength to the valve base and to the tube as a whole, according to the manufacturer.